

AMERICAN GAS ASSOCIATION

Monthly

APRIL 1951





Lafayette saw the world's most Revolutionary Fires

I shall never forget the magical effect produced at Fredonia . . . our eyes were dazzled by the glare of a thousand lights, suspended to the houses and trees that surrounded us.

—From the notebook of General Lafayette's secretary, 1825.

EVERY SCHOOLBOY knows how Lafayette came to America to attend a revolutionary party George Washington was giving for the British. Forty years later he returned to pay a "party" call on the new nation he had helped to set free.

The General expressed a wish to see the "magic fire" which came out of the ground. So he was taken to Fredonia, N. Y., where citizens arranged a mammoth banquet. The natural gas for cooking and illumination

was carried through a pipeline of hollowed cedar logs.

There were, of course, speeches following the banquet and it is certain that the speakers, in the true American tradition, predicted a glowing future for Fredonia and the gas business. But doubtless even the President of the Fredonia Chamber of Commerce circa 1825 could hardly have envisioned that in the year 1950 six trillion cubic feet of natural gas would be distributed through 364,000 miles of pipeline for people to heat with, cook with, and to cool with—another kind of American revolution!

Cities Service is proud of the part it has played in the amazing development of the oil and gas industry, a role that was made possible under the free economic system General Lafayette helped to establish.



Technicians examining interior surface of huge glass-lined brewery tank after firing in gas furnace. Photo courtesy A. O. Smith Corp.

MARK this man! He's the fellow who helped The Ohio Fuel Gas Company win its tenth national safety award in 13 years. His fast thinking enabled Lone Star Gas Company to restore service without serious loss when the 16-inch main from Waco went out near Temple, Texas. His manners can make or break your company's reputation with the public. . . . You know this fellow well. He's an employee of your company and every other gas company, large or small. His high morale and tireless efforts are providing America with the most efficient gas service in the world. . . . Never underestimate this man's power to serve. Take him into your confidence. Explain your company's annual report in understandable terms. Show him the significance of underground storage operations; tell him about the increasing reserves of natural gas. Enlist his support. . . . Today the gas industry is a marked industry, basking in the white light of national prominence. Treat this man, this employee, with understanding and he will lead the way to the brightest future we have ever known.

JAMES M. BEALL
MANAGER, PUBLICATIONS
JAC A. CUSHMAN
EDITOR
RICHARD F. MULLIGAN
ART SUPERVISOR

EDITORIAL OFFICES:
AMERICAN GAS ASSOCIATION
420 LEXINGTON AVE., NEW YORK 17, N.Y.

CONTENTS FOR APRIL 1951

FEATURES

GAS RESERVES HIT NEW PEAK	3
NEW SAFETY HONOR FOR OHIO FUEL	7
LPG FOR STANDBY AND PEAK SHAVING—by A.G.A. Subcommittee on Use and Handling of LP-Gases	9
THE AMAZING GROWTH OF UNDERGROUND STORAGE	10
INSURANCE AND ITS EFFECT ON UTILITY OPERATIONS—by Carl F. Smith	13
RESEARCH IN THE NEWS (LARGE SINGLE-PORT BURNERS, NON-AERATED BLUE-FLAME BURNERS, BURNER FLEXIBILITY)	15
TEXANS PROVE THAT CRISIS BREEDS UNITY	18
HOW TO MERCHANDISE YOUR ANNUAL REPORT—by H. Graham Smith	20

SECTIONS

MORALE—TARGET FOR DEFENSE—by Charles L. Digiovanni	23
SCHOOL BELL CALLS INDUSTRIAL MEN	25
NEXT STOP CHEMICAL AND PRODUCTION	27
A.G.A. APPROVES NEW APPLIANCE STANDARDS	29

DEPARTMENTS

INDUSTRY NEWS	30
A.G.A. ANNOUNCES MARCH '51 PUBLICATIONS	35
PERSONAL AND OTHERWISE	38
ASSOCIATED ORGANIZATION ACTIVITIES	41
OBITUARY	42
CONVENTION CALENDAR	47
PERSONNEL SERVICE	48

THE MONTHLY IS INDEXED BY THE INDUSTRIAL ARTS INDEX

VOL. 33

NO. 4

• Subscription \$3.00 a year - Published eleven times a year by the American Gas Association, Inc. Publication Office, American Building, Brattleboro, Vt. Publication is monthly except July and August which is a bi-monthly issue. Address all communications to American Building, Brattleboro, Vermont, or to 420 Lexington Ave., New York 17, N. Y. All manuscript copy for publication should be sent to the editorial offices in New York. The Association does not hold itself responsible for statements and opinions contained in papers and discussions appearing herein. Entered as Second Class Matter at the Post Office at Brattleboro, Vermont, Feb. 10th, 1922, under the Act of March 3, 1879. Cable addresses: American Gas Association, "Amerigas, New York"; American Gas Association Testing Laboratories, "Amerigaslab, Cleveland."

NATURAL GAS in the United States

TRILLIONS OF CUBIC FEET

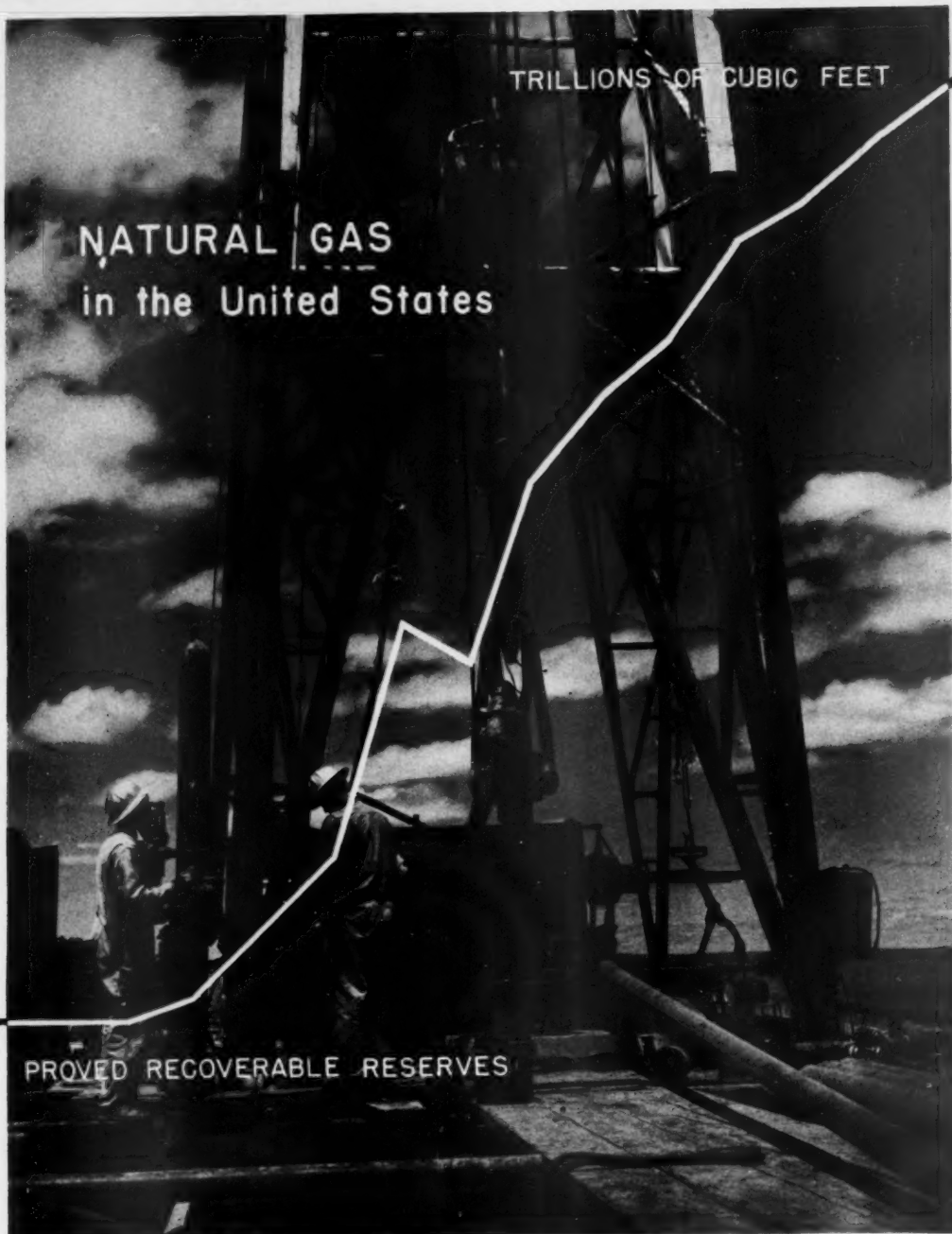
PROVED RECOVERABLE RESERVES

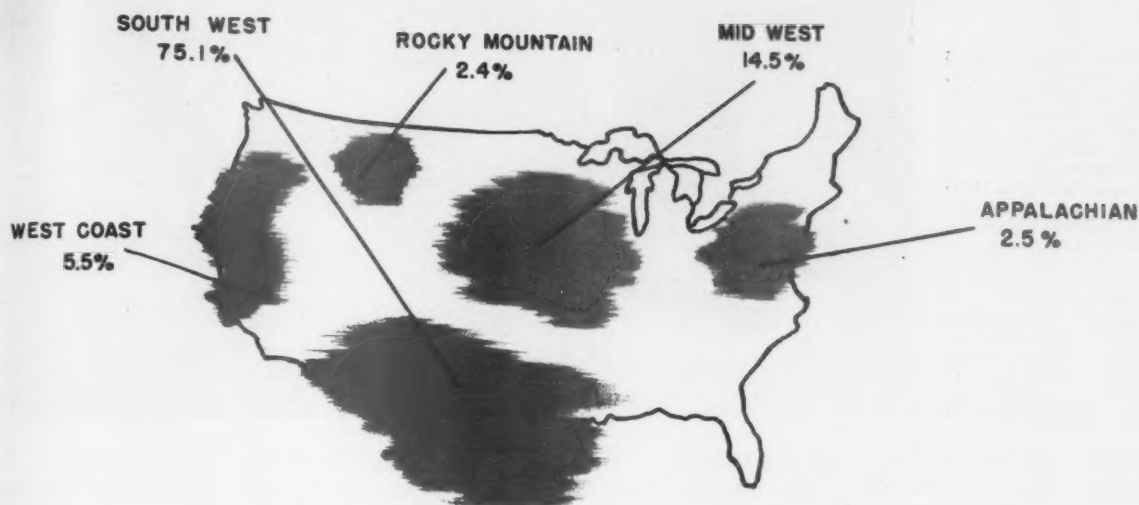
NET PRODUCTION

1850
180
160
140
120
100
80
60
40
20
6.89
0

'35 '40 '45 '50

Photo courtesy Standard Oil Co. (N. J.)





Gas reserves hit new peak

Production of natural gas and discoveries of reserves both continued their upward trend during 1950, according to the latest joint report of the Committees on Reserves of American Gas Association and American Petroleum Institute. Leading experts serving on the two groups estimated that at the end of 1950 proved recoverable reserves of natural gas in the United States reached 185.59 trillion cubic feet—an alltime high.

Production of natural gas again shattered the record set in the previous year—6.89 trillion cubic feet were produced during 1950, as compared with 6.25 trillion cubic feet in 1949. Gross additions during the year amounted to 12.10 trillion cubic feet. The new total of 185.59 trillion cubic feet of proved recoverable reserves is equivalent to a net increase of 5.21 trillion cubic feet since the end of 1949.

During the same 12-month period, production of natural gas liquids amounted to 227 million barrels—another record. At the end of 1950, estimated reserves of natural gas liquids were 4.27 billion barrels or 539 million barrels greater than at the end of 1949.

Discoveries of new natural gas fields and new pools in old fields accounted for an increase of 2.88 trillion cubic feet last year. At the same time, 9.17 trillion cubic feet of natural gas was added through extensions and revisions of previous natural gas estimates in existing fields. The A. G. A. committee report showed convincing evidence of the gas industry's increasing interest in developing new underground storage reservoirs. Estimated reserves of natural gas in underground storage at the end of 1950 were 54.3 billion cubic feet greater than at the end of 1949.

There is also strong evidence that most of the increased production of natural gas during the year was committed to pipelines for ultimate sale to gas utility customers. This is indicated by the fact that the estimated increase in production

during the year was only slightly less than preliminary estimates of the increased gas utility sales of natural gas during 1950.

This was the sixth A. G. A. report and the fifth in a series of joint annual reports by the reserves committees of the two Associations. The latest estimate of proved natural gas reserves is 37.8 trillion cubic feet greater than the initial estimate prepared by the A. G. A. Committee on Natural Gas Reserves at the end of 1945.

N. C. McGowen, chairman of the A. G. A. Committee on Natural Gas Reserves, has headed the group since its founding in October 1945. He is a former president and director of American Gas Association.

During World War II, Mr. McGowen served as a member of the Petroleum Industry War Council and was chairman, Natural Gas and Gasoline Committee for district three (Petroleum Industry Committee appointed by the Petroleum Administrator for War). Recently he was nominated for membership on the Gas Industry Advisory Council appointed by the Secretary of the Interior in Washington, D. C. Leading experts on this council will help to mobilize the gas industry's resources behind the current national defense drive. Mr. McGowen has completed 37 years of service with United Gas Pipe Line Co., Shreveport, La., of which he is president.

Groups of prominent gas industry experts have been appointed by Mr. McGowen to serve as chairmen of subcommittees to estimate reserves in ten natural gas producing regions throughout the United States. These chairmen serve as members of the A. G. A. Committee on Natural Gas Reserves. Membership of the A. G. A. committee is as follows:

Mr. McGowen, chairman; R. M. Bauer, Southern California Gas Co., Los Angeles, Calif.; E. A. Brown, Lone Star Gas Co., Dallas, Texas; R. O. Garrett, Arkansas Louisiana Gas Co.,

NATURAL GAS RESERVES being checked by A. G. A. committee and subcommittee members: (Seated, left to right) Perry Olcott, Houston; J. H. Newlon, Pittsburgh; E. D. Pressler, Houston; C. C. Hoffman, Oklahoma City; L. H. Meltzer, Shreveport; N. C. McGowen, Shreveport, chairman; C. E. Turner, Bartlesville; R. O. Garrett, Shreveport; W. F. Burke, Dallas; George H. Smith, A. G. A.; (standing) O. E. Zwanzig, A. G. A.; James Royds, Denver; C. C. Ingram, Tulsa; Frederick S. Lott, Bureau of Mines; R. E. Houser, Houston; J. T. Scopes, Shreveport



Shreveport, La.; Charles C. Hoffman, Cities Service Gas Co., Oklahoma City, Okla.; Frederick S. Lott, Bureau of Mines; W. S. McCabe, Stanolind Oil and Gas Co., Casper, Wyo.; L. H. Meltzer, Union Producing Co., Shreveport, La.; Perry Olcott, Humble Oil and Refining Co., Houston, Texas; E. E. Roth, Columbia Engineering Corp., New York, N. Y.; J. T. Scopes, Union Producing Co.; Henry Toler, Southern Natural Gas Co., Birmingham, Ala., and C. E. Turner, Phillips Petroleum Co., Bartlesville, Oklahoma. George H. Smith and O. E. Zwanzig, A. G. A., are committee secretary and assistant secretary, respectively.

A total of 52 specially trained geologists and engineers in the natural gas field serve as members of the subcommittees covering the various gas producing regions.

The API Committee on Petroleum Reserves is headed by F. H. Lahee, Sun Oil Co., Dallas. Committee members are as follows: D. V. Carter, Magnolia Petroleum Co., Dallas, vice-chairman; Fred Van Covern, API, secretary; R. F. Baker, The Texas Co., New York, N. Y.; Frank R. Clark, The Ohio Oil Co., Tulsa, Okla.; Morgan J. Davis, Humble Oil & Refining Co., Houston; Alexander Deussen, consulting geologist, Houston; Graham B. Moody, Standard Oil Co. of California, San Francisco; J. M. Sands, Phillips Petroleum Co., Bartlesville, Okla.; P. R. Schultz, Stanolind Oil & Gas Co., Tulsa,

and Theron Wasson, The Pure Oil Co., Chicago, Illinois.

The A. G. A. and API joint reports are reprinted below:

Natural gas reserves

The American Gas Association Committee on Natural Gas Reserves submits its sixth annual report, summarizing the proved recoverable reserves of natural gas and natural gas liquids of the United States, as of December 31, 1950.

Reserves data by states are shown in Table 1 and Table 2.

Table 3 is a summary of the committee's annual estimates of proved natural gas reserves for the past six years, reflecting the changes in the natural gas reserve position in the United States during each of the five years since December 31, 1945. Table 4 shows the proved natural gas liquids reserves of the United States for the last five years and the changes which have taken place in these reserves annually since the first estimate was made as of December 31, 1946.

In order to arrive at an estimate of the total proved liquid hydrocarbon reserves in the United States, the reserves of natural gas liquids shown in Table 2 have been added to the reserves of crude oil estimated by the Committee on Petroleum Reserves of American Petroleum Institute.

The committee has continued the practice begun in the re-



NATURAL GAS

	December 31, 1949	December 31, 1950 (Thousands of Cubic Feet)	Increase 1950 Over 1949
Reserve, Natural Gas	180,381,344,000	185,592,699,000	5,211,355,000
	1949	1950	Increase 1950 Over 1949
Production, Natural Gas	6,245,041,000	6,892,678,000	647,637,000

The production figures for 1950 are net after deducting the amount of gas returned to reservoirs for cycling and pressure maintenance.

LIQUID HYDROCARBON RESERVES

RESERVES	December 31, 1949	December 31, 1950 (Barrels of 42 Gallons)	Increase 1950 Over 1949
Crude Oil	24,649,489,000	25,268,398,000	618,909,000
Natural Gas Liquids	3,729,012,000	4,267,663,000	538,651,000
Total Liquid Hydrocarbons	28,378,501,000	29,536,061,000	1,157,560,000
PRODUCTION	1949	1950	Increase 1950 Over 1949
Crude Oil	1,818,800,000	1,943,776,000	124,976,000
Natural Gas Liquids	198,547,000	227,411,000	28,864,000
Total Liquid Hydrocarbons	2,017,347,000	2,171,187,000	153,840,000

**TABLE 1—ESTIMATED PROVED RECOVERABLE RESERVES
OF NATURAL GAS IN THE UNITED STATES** (Millions of Cubic Feet—14.65 psia, at 60 Deg. F)



	Changes in Reserves during 1950					Reserves as of December 31, 1950 ^b				
	Reserves ^a Dec. 31, 1949	Extensions and Revisions ^b	Discoveries of New Fields & New Pools in Old Fields ^b	Net Change Under- ground Storage ^c	Net Production ^d	Total	Non- Associated ^e	Associated ^f	Dissolved ^g	Underground Storage ^h
Arkansas	874,190	65,072	23,129	540	55,338	907,593	450,935	157,869	296,789	2,000
California ⁱ	9,991,635	225,279	71,840	4,028	532,396	9,760,386	2,702,746	2,286,788	4,751,693	19,159
Colorado	1,227,095	(-) 134,453	41,426	0	18,595	1,115,473	474,704	33,528	607,241	0
Illinois	233,192	26,774	5,700	0	35,773	229,893	5,643	15,000	209,250	0
Indiana	25,200	6,720	4,920	750	6,400	31,190	4,000	5,000	21,440	750
Kansas	14,089,560	64,729	30,360	153	393,968	13,790,834	13,381,105	152,189	228,239	29,301
Kentucky	1,349,397	49,294	8,200	(-) 908	75,400	1,330,583	1,254,997	0	64,000	11,586
Louisiana ⁱ	26,687,811	2,010,120	751,133	0	915,798	28,533,266	22,477,745	4,162,574	1,892,947	0
Michigan	214,911	(-) 14,820	2,741	10,528	18,286	195,074	121,867	0	40,906	32,301
Mississippi	2,528,969	130,470	5,030	0	145,263	2,519,206	1,772,969	410,436	335,801	0
Montana	803,471	34,951	0	2,402	43,463	797,361	722,647	44,799	25,421	4,494
Nebraska	8,063	9,028	28,073	0	1,058	44,106	14,886	21,213	8,007	0
New Mexico	6,241,003	866,625	124,404	6,883	248,245	6,990,670	3,978,271	2,098,103	896,210	18,086
New York	66,685	200	0	1,094	3,200	64,779	53,375	0	595	10,809
Ohio	652,571	38,751	7,900	6,840	47,200	658,862	550,548	0	34,500	73,814
Oklahoma	11,625,979	486,813	121,163	8,250	607,918	11,634,287	7,509,209	1,011,782	3,088,927	24,369
Pennsylvania	621,680	31,000	50,000	(-) 509	75,000	627,171	528,569	0	40,750	57,852
Texas ⁱ	99,170,403	5,055,893	1,557,691	490	3,380,400	102,404,077	71,529,387	17,646,015	13,228,185	490
Utah	65,577	8,196	15,112	0	4,133	84,752	76,331	0	8,421	0
West Virginia	1,715,233	105,152	21,750	13,540	205,000	1,650,675	1,513,009	0	81,500	56,166
Wyoming	2,173,677	96,631	2,749	220	78,288	2,194,989	1,481,156	128,456	584,864	513
Miscellaneous ^a	15,042	9,956	4,030	0	1,556	27,472	24,356	0	3,116	0
Total	180,381,344	9,172,381	2,877,351	54,301	6,892,678	185,592,699	130,628,455	28,173,752	26,448,802	341,690

^a Includes Alabama, Florida, Maryland, Missouri, North Dakota and Virginia.

^b Excludes gas loss due to natural gas liquids recovery.

^c The net difference between gas stored in and gas withdrawn from underground storage reservoirs.

^d Net production equals gross withdrawals less gas injected into underground reservoirs; changes in underground storage are excluded. December production estimated occasionally.

^e Non-associated gas is free gas not in contact with crude oil in the reservoirs.

^f Associated gas is free gas in contact with crude oil in the reservoirs.

^g Dissolved gas is gas in solution with crude oil in the reservoirs.

^h Gas held in underground reservoirs for storage purposes only.

ⁱ Includes off-shore reserves.

**TABLE 2—ESTIMATED PROVED RECOVERABLE RESERVES OF
NATURAL GAS LIQUIDS IN THE UNITED STATES^a** (Thousands of Barrels of 42 U. S. Gallons)



	Changes in Reserves During 1950				Reserves as of December 31, 1950			
	Reserves Dec. 31, 1949	Extensions and Revisions	Discoveries of New Fields and New Pools in Old Fields	Net Production	Total	Non- Associated	Associated	Dissolved
Arkansas	55,642	745	230	3,679	52,938	31,997	7,586	13,355
California ^a	320,275	71,079	250	28,217	363,387	0	137,492	225,895
Colorado	24,190	(-) 10,837	0	432	12,921	873	0	12,048
Illinois	26,666	3,003	28	3,438	26,259	28	75	26,156
Indiana	126	34	24	32	152	20	25	107
Kansas	106,405	60,578	341	3,746	163,578	159,702	1,594	2,282
Kentucky	13,245	308	154	1,780	11,927	11,927 ^c	0	0
Louisiana ^d	596,422	56,492	18,992	28,394	643,512	498,484	97,437	47,591
Michigan	1,203	(-) 75	14	124	1,018	609	0	409
Mississippi	56,407	2,040	100	2,650	55,897	26,558	23,295	6,044
Montana	3,710	81	0	244	3,547	3,547	0	0
Nebraska	37	65	140	7	235	74	107	54
New Mexico	85,719	11,773	1,370	4,965	93,897	30,876	33,211	29,810
Ohio	1,670	108	12	102	1,688	1,688 ^c	0	0
Oklahoma	234,030	61,897	4,922	20,946	279,903	121,708	24,868	133,327
Pennsylvania	2,643	135	68	247	2,599	2,599 ^c	0	0
Texas ^d	2,143,711	443,190	31,326	122,188	2,496,039	1,434,654	359,067	702,318
Utah	208	(-) 9	0	5	194	194	0	0
West Virginia	12,831	634	212	4,701	8,976	8,976 ^c	0	0
Wyoming	43,863	6,636	0	1,512	48,987	37,675	6,390	4,922
Miscellaneous ^b	9	2	0	2	9	0	0	9
Total	3,729,012	707,879	58,183	227,411	4,267,663	2,372,189	691,147	1,204,327

^a Includes condensate, natural gasoline and liquefied petroleum gas.

^b Includes Alabama and Florida.

^c Not allocated by types but occurring principally in the column shown.

^d Includes off shore reserves.

port of December 31, 1948 of reporting the volume of gas in storage in underground reservoirs. The "stored gas" is considered to be the gas which has been transferred from its original location in a gas and/or oil field to another natural underground reservoir for the primary purposes of conservation, fuller utilization of pipeline capacities and more effective delivery to markets. The "stored gas" reserve is the quantity placed in a natural reservoir and not yet removed. Any additional recoverable gas which may have been in the underground storage reservoirs when injection was begun and has not yet been produced is classified and listed in its proper category. Withdrawals from or additions to storage are included in the figures shown under the heading "Net Change in Underground Storage." This is distinguished from "net production" which refers to gas removed from a producing reservoir.

The committee points out again that often it is not possible to estimate the total reserves of a field in the year of its discovery. Satisfactory estimates can be made only after there has been sufficient drilling in the field and, in some cases, adequate production history. For these reasons, the reserves listed as discovered during any current year must be considered only as the reserves indicated by the drilling in that year. The estimated reserves of the new fields and pools will be revised in future reports in the light of later developments and shown as "Extensions and Revisions."

Procedure followed in estimating and assembling the proved reserve figures were the same as those used in past reports. Proved reserves may be in either the drilled or undrilled portion of a given field. Where the undrilled areas are considered proved, they are so related to the developed acreage and to the known field geology and structure that their productive ability is considered assured. Proved recoverable reserves of natural gas are the reserves estimated to be producible under present operating practices. Since the estimates are made by fields, the recovery factors or abandonment pressures used in the calculations were governed by the operating conditions in each individual field. Proved recoverable reserves of natural gas liquids are those contained in recoverable gas reserves.

For purposes of developing these reserve estimates, natural gas liquids are defined as those hydrocarbon liquids that are gaseous in the reservoir but are obtainable by condensation or absorption. Natural gasoline, condensate, and liquefied petroleum gases fall in this category. In order to prevent misunderstanding of this term it is further amplified as follows: Natural gas liquids are those heavier hydrocarbon components of the natural gas which may be removed and reduced to the liquid

state by various processes. These processes usually take place in field separators, scrubbers, gasoline plants, or cycling plants. The liquids so collected and the products made from them in some of the modern plants are known by a variety of names but they have been grouped together here under the general heading "natural gas liquids."

The estimates presented in this sixth annual report incorporate the results of careful detailed studies of many hundreds of fields and pools throughout the United States. Their preparation has required the help and active cooperation of specially trained geologists and engineers familiar with the developments in many producing areas throughout the country. The committee is fortunate in the help it has received from this group of men who have served as subcommittee members. As in past years, they have given generously of time and effort to make these estimates as complete and accurate as possible.

Petroleum reserves

As will be recalled, beginning with our report for December 31, 1946, the estimates presented on proved liquid hydrocarbon reserves were expanded to include not only crude oil, but also all classes of natural gas liquids. (See definition of natural gas liquids as given by A. G. A. committee.) The figures on crude oil were prepared by the API Committee, and the figures on natural gas liquids were prepared by the A. G. A. Committee in cooperation with the API Committee. For the present report, the same procedure has been followed.

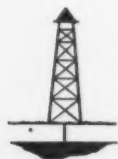
As of December 31, 1950, the committee estimates that the proved reserves of crude oil in the United States amounted to 25,268,398,000 barrels. The natural gas liquids totaled 4,267,663,000 barrels, making a grand total of 29,536,061,000 barrels. This is shown in the following tabulations which include in their respective states the offshore proved reserves in California, Louisiana and Texas.

The estimates in this report, as in all previous annual reports of this committee, refer solely to proved or blocked-out reserves. They include only oil and natural gas liquids recoverable under existing economic and operating conditions.

The estimates made for this report committee do not include:

- (1) Oil* under the unproved portions of partly developed fields.
- (2) Oil in untested prospects.
- (3) Oil that may be present in unknown prospects in regions believed to be generally favorable.
- (4) Oil that may become available by fluid injection methods from fields where such methods (Continued on page 44)

* The word "Oil" unless defined as crude oil, is used in this report as essentially equivalent to liquid hydrocarbons.



NATURAL GAS RESERVES

	(Thousands of Cubic Feet)
Total proved reserves as of December 31, 1949	180,381,344,000
Extensions and revisions of previous estimate	9,172,381,000
New reserves discovered in 1950	2,877,351,000
Net changes in "stored gas" during 1950	54,301,000
Total proved reserves added and net changes in "stored gas" during 1950 ..	12,104,033,000
Total proved reserves as of December 31, 1949 and additions during 1950 ..	192,485,377,000
Deduct production during 1950	6,892,678,000
Total proved reserves of natural gas as of December 31, 1950	185,592,699,000

Reserves data are shown by states in Table I.

Management—employee support helps
win tenth national safety award in 13 years

New safety honor for Ohio Fuel



R. C. Kadel (left), safety director, The Ohio Fuel Gas Co., presenting American Gas Association's accident prevention merit certificate to C. F. Bronson, manager of the Elyria District



District Manager Bronson, Sue Heller, home service director, and C. V. Unger, plant superintendent and safety committee chairman, checking awards to employees of district that worked four million safe manhours

Why does our company have such a good (or bad) safety record? This question has plagued top management and safety men ever since the term "accident prevention" was coined. R. C. Kadel, safety director for The Ohio Fuel Gas Co., Columbus, Ohio, believes that his company has found an answer to that question.

Earlier this year, The Ohio Fuel Gas Co., often referred to as the Columbus Group of The Columbia Gas System, Inc., received word that it had won first-place honors among large gas companies in National Safety Council's 1950 Public Utilities Contest. This is the tenth time in 13 years that the company has taken top place among gas utilities in its size group.

Mr. Kadel points to two major reasons for this unusual feat. "The real secret of a successful safety record," he told the MONTHLY last month, "is to get each worker to be safety-conscious. In addition, your company management must back the accident prevention program right down the line."

Ohio Fuel Gas started its safety program in 1929. Since then, supervisors and employees have assumed more and more responsibility in accident prevention. Today, safety is such an integral part of every job that each employee looks upon himself as "My brother's keeper."

This point is dramatically illustrated by the case of a worker in the Mansfield distribution department (see accompanying illustration). In 1949, Frederick Nice sustained a severe injury while loading a ditching machine onto a flat-bed trailer that had been uncoupled from a truck. The loading was done in the usual way, but according to the company's accident prevention department, the safe way of "anchoring" the trailer—blocking the wheels—was neglected. When Mr. Nice jumped to the ground to steer the trailer into a bank, his ankle turned and a dual wheel of the trailer ran over his left knee.

The accident itself is not unusual—motor vehicle mishaps form a large percentage of employee accidents in most industries. In this case, however, the em-

ployee realized the mistake that had been made and appealed direct to his fellow workers to be more careful in their everyday work. His open letter, written from a hospital sick bed, was reprinted in the company magazine, *The Gasco News*, and made a strong impression on other workers.

This spontaneous employee appeal is even more remarkable when the company's early record in accident prevention is examined.

Prior to 1928, Ohio Fuel Gas and affiliated companies had practically no safety program at all. Accidents costly to employer and employee alike were looked upon more or less as an unavoidable part of business. The only semblance of accident prevention was a committee which met in the general office every two or three months.

Serving on this early group were some of the company's operating superintendents who usually reviewed the major accidents and gravely thought that the condition was serious. After talking over

the situation, the committee "walked out of the conference and forgot all about it until the next meeting was called."

Late in 1928, the company's president stepped into the accident prevention picture. The secretary of the company, in addition to his regular duties, was handed the job of reducing accident totals. Mr. Kadel at that time was a stenographer in the secretary's office. He was given added job of accident prevention manager.

"Neither of us had any training in accident prevention work," he explained to the MONTHLY reporter. "One of the first jobs we tackled was installation of first aid kits. We also made a personal visit to all departments, demonstrating use of supplies in the kits and giving instruction on artificial respiration. We feel now that first aid has played a big part in our accident prevention program. Prior to World War II, more than 85 percent of

to work.

Shortly thereafter, the safety department received a stenographer, increasing the staff to three people where it remains today.

Management's full support definitely started the safety program in the right direction. However, one of the biggest stumbling blocks in those early years was the job of selling supervisors on the need for such a campaign.

Mr. Kadel remembers to this day some of the problems that had to be faced. "According to many of the oldtimers they never had accidents in their departments. But when compensation payments were requested and doctor bills had to be paid, and all had to clear through our office, we really had something to work on."

The first year that accident statistics were kept showed a frequency rate of

1.11 and a severity rate of 3.4. The following year frequency was reduced to 28.7. Year after year, the record improved.* Since 1937 frequency has fluctuated between a low of 1.11 in 1938 and a high of 3.9. Lowest severity rate was achieved in 1939 with a figure of .01. Last year, Ohio Fuel Gas with an average of 3,450 employees, worked 7,278,126 manhours with only 13 disabling injuries.

How was this feat accomplished? For one thing, the safety department has concentrated on making each worker safety conscious. Bulletin boards are used widely for displaying posters of National Safety Council and the Department of Safety and Hygiene, The Industrial Commission of Ohio. A spirit of competition has been fostered among all districts and divisions—group records are exhibited in prominent places for all employees to see and compare.

Today each department has either an accident prevention committee or holds special safety meetings of employees. Specific accidents are analyzed at these meetings and corrective measures discussed.

Each year since 1933, the company has designated August as "No Accident Month." Preparations for this event are started in July with the result that it too is often free of accidents. Usually the program continues for some time after August. In recent years, the entire Columbia Gas System has joined in this no-accident-month campaign and, in addition, January is now designated as a "No Motor Vehicle Accident Month."

Safety consciousness of employees—major objective of the campaign—was accomplished largely by placing responsibility upon the various supervisors. Each report of injury originates with the foreman and is approved by the manager or superintendent. When the report reaches the office of the safety director, all correspondence concerning it is sent through the manager back to the foreman and injured employee.

The Gasco News, issued monthly, gives added impetus to the safety drive. The magazine carries full-page articles on safety, in addition to smaller news items. The January 1951 issue ran a full-page feature story on award of American Gas Association's safety merit certificate to the Elyria distribution district. A. G. A. commended employees of the district on their record of 4,026,884 manhours of work (ending April 30, 1950) without a single disabling injury.

Special awards from the company itself, combination pencils and ball point pens, were presented to over 200 employees at the district's annual Christmas party on December 9, 1950. Each individual award was inscribed with the employee's name and a message from the company conveying its appreciation of his help in establishing the district's unbroken safety record.

The Elyria district's safety committee is composed of staff members and local managers, with C. V. Unger, distribution superintendent, as chairman. District Manager Bronson attributes the fine safety record to "safety consciousness."

"All of our folks actually work full-time at accident prevention," he said. "New men get an intense safety indoctrination from (Continued on page 36)



Following a serious motor vehicle accident in 1949, Frederick Nice, distribution worker at The Ohio Fuel Gas Co., wrote his fellow employees to be careful and "not to get hurt so that you won't have to go through what I am going through now." Recently, Mr. Nice gave the MONTHLY permission to print his letter and picture. "I hope," he wrote, "that it will be helpful in preventing other accidents throughout the gas industry"

our employees were trained in first aid. In recent months some 50 percent have received a refresher course."

Up until that time, frequency and severity rates were virtually unknown to the company. However, at the beginning of 1929, complete records were compiled for all accidents—another major step forward. In February of that year, the accident prevention department received the additional duties of handling Workmen's Compensation records and payrolls—the company is a self-insurer under the Ohio Workmen's Compensation Act. The extra job of looking after compensation work proved a big help to the safety director and his staff. For the first time it gave them concrete facts with which

* Frequency rate—disabling injuries per million manhours worked; severity rate—time charges (days) per thousand manhours.

Reasons why propane-air plants are desirable during winter peaks

LPG for standby or peak shaving



Standard Oil Co. (N. J.) photo

● Preparation of the following article was arranged by the Editorial Committee (of the A. G. A. Operating Section), Jesse S. Yeaw, laboratory director, Rochester Gas & Electric Corp., Rochester, N. Y., chairman. The article was written especially for the MONTHLY by Subcommittee on Use and Handling of LP-Gases (of the Gas Production Committee).

The prospect of receiving natural gas through long transmission lines to the Eastern Seaboard and New England, has further aroused the interest of gas plant operators in those areas in the use of LP-gases as standby fuel or for peak shaving. The LP Subcommittee of the Association's Gas Production Committee is frequently called upon for advice about utilization of the LP-gases as substitutes for natural gas.

In January, A. B. Lauderbaugh, chairman of the LP-Gas Subcommittee, presented a paper on "Propane for Peak Shaving" before the Operating Section of the New England Gas Association. He called attention to the fact that propane-air gas, like any peak load gas, is expensive and can be used only for the ten to 20 days during each winter season when demand will be within ten percent of that on the peak day. These are the days when the use of propane-air may make possible substantial savings for those companies that will be buying natural gas on a demand commodity rate.

Propane-air plants are desirable as peak shaving plants for several reasons. First, because propane-air is interchangeable with natural gas. Second, because it can be sent out at any pressure up to 350 psig if it is mixed fifty-fifty with natural gas. Third, it can be placed close to the point of demand. Fourth, it can be started up and shut down quickly. Fifth, the plants can be designed to be entirely automatic and unattended, except for daily inspection, or can be designed to operate with a minimum of one man per shift. Sixth, propane-air plants can be constructed to have almost any desired send-out capacity, and have a stepless "turndown" of at least ten-to-one.

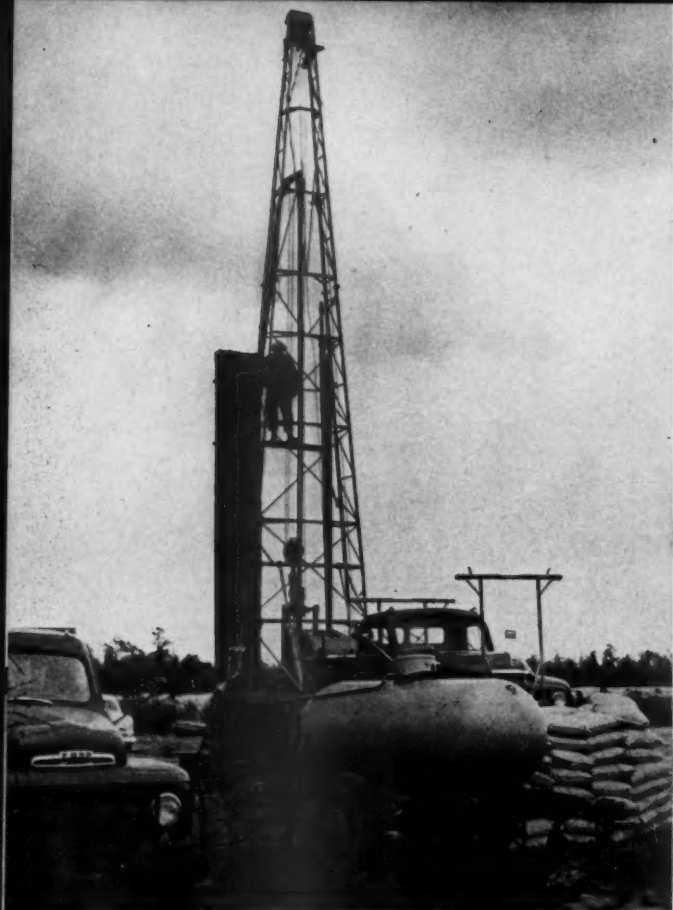
Estimates of plant installation cost vary widely because of the different requirements at different locations. Two plants having the same maximum daily send-out capacity will differ in cost, because one delivers gas at ten ounces pressure, while the other delivers the propane-air gas at 100 psig. Or one plant may be so located that it makes use of auxiliary

equipment already installed for other operations, whereas the second plant may be entirely new and require a full complement of auxiliary equipment.

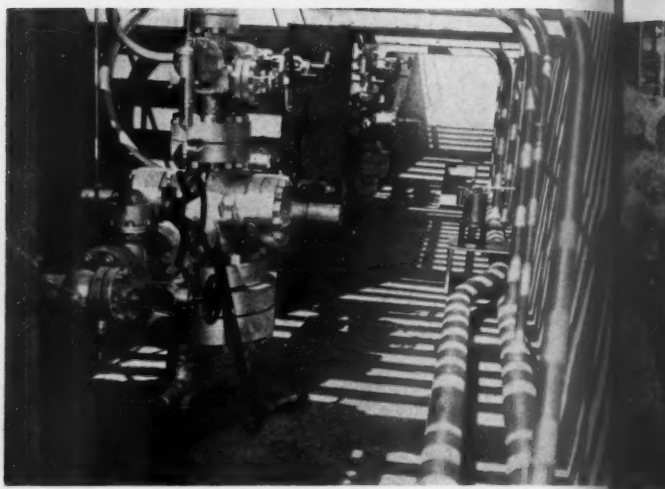
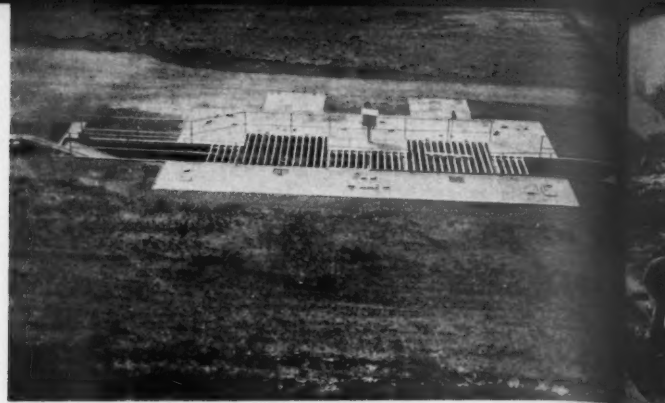
Obviously, the maximum capacity of the plant will be controlled by the amount it is desired to "shave" the peak day. Since the only safe way is to provide enough storage for all the winter season requirements, the number of storage tanks installed should be enough to supply all of the gas required for a winter season's operation.

The installed cost for propane storage tanks having 30,000 gallons water capacity, including everything associated with the tanks and tank farm, will vary between \$14,000 per tank for a five-tank installation, and \$12,000 per tank for a 20-tank installation. Construction costs of propane-air plants have increased almost ten percent per year during the past five years. Because the direct labor cost of a propane-air plant is only 12 percent of the total cost (Continued on page 48)

Maximum Daily Plant Capacity in MMcf Equivalent Natural Gas	Estimated Plant Cost Without Storage	Estimated Storage Cost for Six-Day Supply at Maximum Rate
3	\$ 93,000	\$109,000
5	132,000	156,000
7	178,000	210,000
10	235,000	275,000



This derrick in operation on a New Jersey farm is part of Transcontinental Gas Pipe Line Corporation's search for structural formations near market area that are suitable for storage of gas



Goleta Field—largest underground storage project in California: (Top) two completed wells in same pit, flush with surface and covered with rails due to proximity of airport. (Bottom) wellhead installation in pit

The amazing growth of underground storage

Number of natural gas "savings banks" in use has risen to more than one hundred—five times the 1940 total

Residents of a small New Jersey community speculated last month concerning the sudden appearance of a portable derrick on a 50-acre blueberry farm. They crowded the area to watch workers from a Texas company sink a shaft 1,200 feet into the ground.

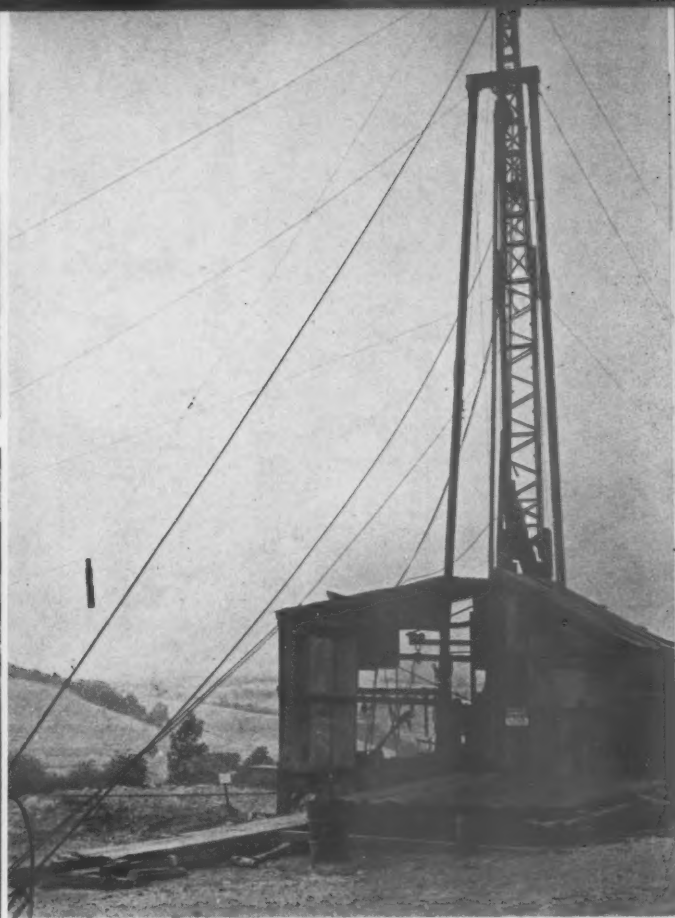
Rumors flew thick and fast. New York newspapers picked up the story. It wasn't until a day or two later that the true story came out. The search was not for oil, but for an underground reservoir to store nature's cleanest fuel—natural gas.

Similar occurrences have been noted in state after state. Today, underground storage of natural gas is a major phenomenon of the American scene.

Figures tell the story. The first known successful use of underground storage of natural gas took place in Welland County, Canada, in 1915.¹ By 1940, a total of 19 storage fields had been started. The number rose by 1949 to at least 80 storage fields in use and 14 more being prepared.² The total now stands at well over 100.



Michigan Gas Storage Company's program to improve service to Consumers Power Company includes (top) new compressor station in the storage fields. (Bottom) installing pipe near the gas cleaner tanks



Drilling rig in action near Belmont, Pa., during early development of the Oakford Storage Field, owned jointly by New York State Natural Gas Corporation and Texas Eastern Transmission Corp.

Latest official figures for the industry have just been released by American Gas Association's Committee on Natural Gas Reserves. Leading experts serving on this group estimate that at the end of 1950, a total of 341,690,000,000 cubic feet of natural gas was being stored underground in the United States. This represents a net increase of more than 54 billion cubic feet to underground storage pools during the year.³

Importance of these underground "savings banks" is indicated by a dramatic fact. Of more than 2.7 billion dollars that the natural gas industry plans to spend on expansion from 1950 through 1954, approximately half a billion dollars will go for underground storage facilities.

This huge expenditure will be an im-

portant step in helping the natural gas industry to meet peak loads and to prepare against pipeline failures. Underground storage facilities will help to increase pipeline load factors and improve the industry's ability to serve the booming house heating load.

Seasonal fluctuation of market demand for gas is such an important subject that it received the notice of Federal Power Commission in 1948. FPC's "Natural Gas Investigation, Docket G-580" noted in part that "a major need exists for further developments of terminal storage and other appropriate types of centralized standby facilities, in order to supplement the maximum daily supplies which can be delivered economically from pipeline transportation systems and to assure greater reliability of service during seasonal peak periods."

In order to obtain a clear picture of the present situation in underground storage the MONTHLY has surveyed a representative cross-section of gas companies throughout the country. These

companies, together with others that have applied recently for permission to expand their underground storage facilities, operate a majority of the underground fields now in existence or planned.

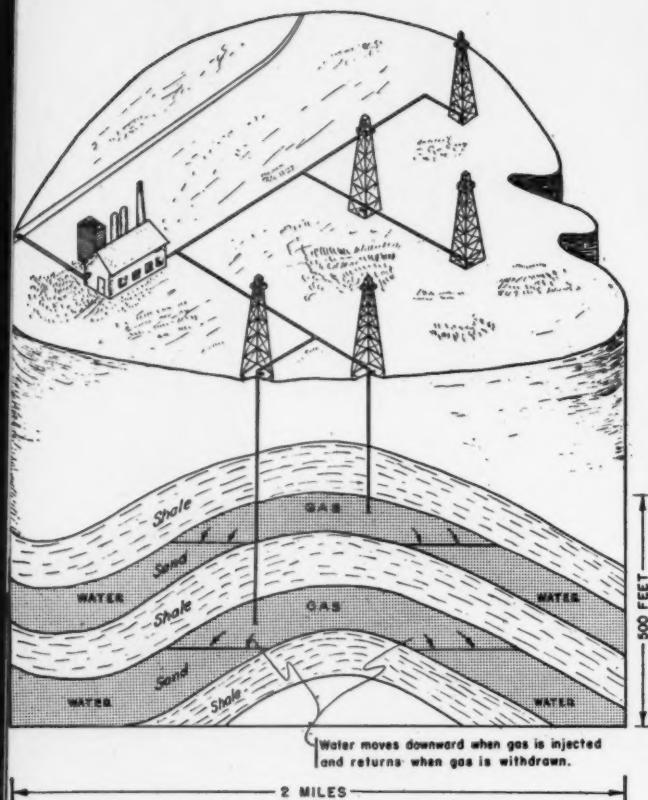
Replies to this spot survey provide answers to most of the following questions: (1) How much gas is now stored underground by your company? (2) How many underground storage fields are currently in operation, and how close are these fields to your company's markets? (3) Approximately how many days of supply are contained in these fields? (4) Briefly, what additional storage facilities are planned, and (5) Very briefly, how does your company condition its old wells for receipt of storage gas?

The Columbia Gas System, Inc. New York, N. Y., reported that total gas in storage on November 1, 1950 was 128 billion cubic feet. The figure had fallen to 106 billion cubic feet by December 31 and to 93.1 billion cubic

¹ See "Underground storage and migration of gas," by F. E. Vandaveer and J. J. Schmidt (A. G. A. MONTHLY, September 1950, p. 18).

² "Underground Gas Storage," by Max W. Ball (A. G. A. Proceedings, 1949, p. 35).

³ See Table 1, page 5, this issue of the A. G. A. MONTHLY.



Diagrammatic sketch of dome structure showing how natural gas is stored through displacement of water from reservoir sand—the type structure sought by Transcontinental Gas Pipe Line Corp.

feet on January 31. The fluctuation is due largely, of course, to reductions during the heating season that are rebuilt during the summer months.

Columbia Gas now has 44 storage fields, either active or in process of being activated.

Broadly speaking, the system takes three steps in conditioning its storage fields for receipt of gas. First, a complete examination is made of the area, based on past performance and determination of the boundaries of the gas-holding formation. The formation must be "tight" in order to prevent migration of gas to other areas.

Another step is to make certain that the gathering lines are of sufficient size to handle the volumes of gas to be pumped into and released from the storage field. Sufficient compressor facilities must be available to move the gas.

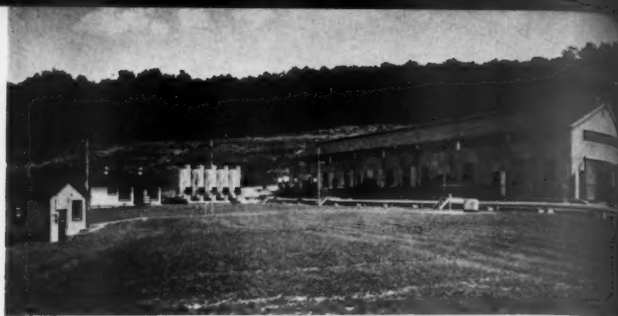
Then the old wells are cleaned. New casing, tubing and fittings are installed. Often the casing is cemented to prevent leakage in the well fittings. In many cases, new wells are drilled to

the storage sands to increase the rate at which gas can be pumped into storage and delivered from the field.

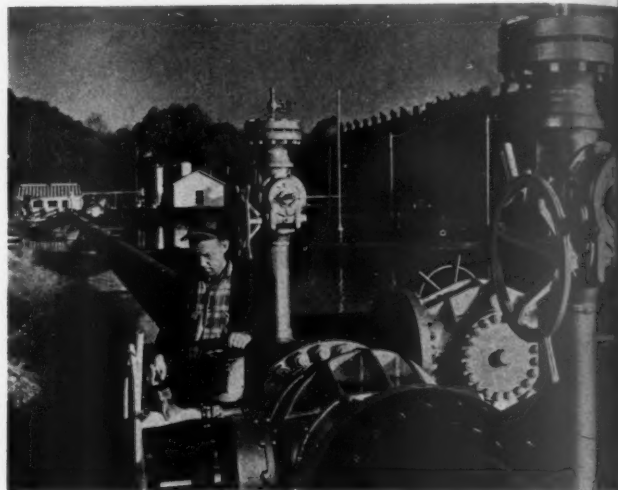
(One of the most readable publications on this subject is "Columbia's underground savings bank" published by The Columbia Gas System, November 1948, in booklet form.)

Pacific Lighting Gas Supply Company in Los Angeles owns and operates by far the largest underground storage project in California—the Goleta Storage Field. Located about 105 miles northwest of Los Angeles, this field has a working capacity of ten billion cubic feet annually. Its daily deliverability is 275 million cubic feet which can be maintained for approximately 35 days during each winter period.

The company proposes to drill two additional wells this summer which are expected to raise daily deliverability to 375 million cubic feet a day. Input of the Goleta Field varies between 85 and 105 million cubic feet a day, depending on input pressures.



Boom Station, located in northern tier of Pennsylvania near New York State, performs vital storage job for New York State Natural Gas Corp.



Installation at Columbia Gas System's Cobb Compressor Station through which move billions of cubic feet of natural gas to and from storage. The system has 44 storage fields in use or being activated.

Underground storage is performed for Consumers Power Co., Jackson, Mich., by its subsidiary, **Michigan Gas Storage Company**. As of February 28, 1951, a total of 58 billion cubic feet of gas was stored underground. This includes 50,420,000,000 cubic feet of cushion gas, and 7,580,000,000 cubic feet of storage or cyclic gas. When full, the underground system will accommodate 23,570,800,000 cubic feet of storage fuel.

Michigan Gas Storage Company's two underground fields are located in North Central Michigan approximately 60 miles from the nearest market and 160 miles from the farthest market. They are connected to markets by direct lines. The fields when full contain about 101 days of maximum output, 233 million cubic feet a day.

Future plans include a project for converting the Riverside gas field to storage use with a cyclic storage capacity of approximately one and a half

(Continued on page 42)

Insurance and its effect on utility operations

By CARL F. SMITH

*Southern California Gas Co.,
Los Angeles, Calif.*

● Excerpts printed below are from an address before the Technical Section of the Pacific Coast Gas Association in Coronado, Calif., on February 14, 1951. The article offers valuable information on an important subject but does not purport to represent insurance practices of the industry on a subject on which there necessarily is no universal agreement. See also "The executive and casualty insurance," A. G. A. MONTHLY, December 1950, pp. 5-6.

How does the application and interpretation of insurance affect the utilities and their operations? Let's start by enumerating six principal responsibilities of utilities in insurance or related matters:

(1) *Responsibilities under statutory provisions*—Most important items in this group are employees' workmen's compensation benefits, unemployment insurance, employees' unemployment disability benefits, and surety bonds required thereunder when such benefits are self-insured. Other items are the obligation to pay on account of assumed, contractual and/or legal liability for injury to and/or death of persons, and loss or damage to property of others, including loss of use thereof, arising out of or in connection with or incidental to the properties and operations of the utilities. Also surety bonds and/or cash deposits in connection with franchises and excavation permits, use of highways and certain rights-of-way. Then there is the Financial Responsibility Law in connection with automobile accidents. Also in the group are

state laws and/or local ordinances with respect to the inspection of elevators, boilers, and pressure vessels, and the issuance of certificates of operation thereon. Don't overlook inspections and permits as required by fire prevention bureaus for places of public assemblage, storage of certain inflammables, and certain items of property such as filling stations, portable gasoline buggies, garages, barbed wire fences, tar pots, etc.

(2) *Responsibility to investors*—As most utilities are financed by the sale of mortgage bonds and other securities to the public, agreements are usually made to reasonably protect these investors' interests in the properties, by the principle of insurance by adequate reserves, for loss or damage arising out of fire, explosion, flood, water, windstorm, smoke, hail, plate glass, riot, strike, civil commotion, earthquake, auto, and aircraft. There is the need to protect against the loss of money, property, securities, etc., as the result of theft, burglary, holdup, forgery, embezzlement, etc., committed by employees or other persons. In addition to the direct losses above there is also the loss of use, occupancy, and revenue occasioned by such losses to consider.

(3) *Responsibility for employees' social and welfare benefit*—In addition to the statutory employee benefits, utilities generally provide for their employees, in whole or in part, supplemental old age benefits under pension plans, non-occupational disability benefits, life insurance, and hospital, surgical and medical benefits.

(4) *Responsibility for accident prevention*—Utilities should take every conceivable advantage towards accident prevention. Accidents usually are costly and such costs always end up as a part of the cost of insurance. In many cases, accident

ALL-PURPOSE INSURANCE COMPANY

UTILITY'S RESPONSIBILITIES

- 1 Statutory
- 2 To investors
- 3 Employees' Social and Welfare Benefits
- 4 Accident prevention
- 5 When accidents occur
- 6 Independent contractors



prevention statutory obligations apply to safety and health requirements in compliance with state laws, codes, and accepted safety standards. Some utilities take the position that it is better to spend money in the various phases of accident prevention, and assume certain risks under their self-insurance, in lieu of placing outside insurance to cover such risks, and thereby recover dollars for loss or damage. This seems to be a sound position as some accidents result in the interruption of service to the utilities' customers which then creates untold problems even beyond the scope of insurance. It is customary that utilities employ competent and trained safety engineers and technicians who are responsible for accident prevention. Salaries and expenses of these employees are considered a part of the cost of insurance.

(5) *Responsibility when accidents occur*—When any accident or other condition occurs in connection with the responsibility of insurance, it is imperative to make a complete investigation and obtain all of the facts in connection therewith. Such a report serves a dual purpose. First, it provides the utility's safety department and other departments involved with an opportunity to establish procedure to prevent a recurrence.

Second, it provides the utility's claims department and others with the necessary information to determine the responsibility of those involved. These reports are also used to substantiate the ultimate preparation of claims against others; or the payment of claims to others by the

utility. As most utilities' over-all insurance program combines outside insurance with self-insurance, it is important to route accident reports to the department responsible for their particular administrative function of the problem. Salaries and expenses of claims department employees are likewise considered a part of the cost of insurance.

It is recognized when representatives of the utilities are dealing with employees or the public in connection with any accident that immeasurable advantages in the matter of employee and public relations can and should be a primary objective.

(6) *Responsibilities of independent contractors*—The matter of insurance requirements of independent contractors, who perform work for the utilities has become an important item in utility management. This is true not only in the matter of the forms and amounts of insurance, but also as regards the reimbursement of premiums or costs directly or indirectly applicable for their insurance.

Contractor requirements

It generally is standard procedure by the utilities, as part of contracts let, to include in the various contract forms specific insurance requirements of the contractor, in addition to indemnification and/or hold harmless provisions. To this extent contractors should be selected by their ability to meet the financial responsibilities which may exceed the insurance requirements contained in the contract, as well as their ability to do a good job. To exercise this control, con-

tractors should be required to submit financial statements, copies of insurance policies, or certificates thereon prior to the letting of a contract or the performance of any work. After a review of these documents by experienced personnel, approval or disapproval could then be given. It might be necessary at times to exercise discretion and judgment in rendering such approvals as certain contractors, principally the smaller ones, do not carry satisfactory limits of liability insurance because of the volume of small jobs and the nature of the work they ordinarily perform. However, it always should be remembered that the extent and amount of a potential loss cannot be measured by the size of the job and the nature of the work.

With the volume of work for utilities by independent contractors, and particularly pipeline work, it is important that a program of cooperation between the contractors and the utilities be arranged in connection with accidents, loss or damages which occur on work done by such contractors. It is usually inevitable when an accident or damage occurs in such work that calls or reports come direct to the utilities on such matters. The claims department of Southern California Gas Company has worked out with their pipeline contractors a very satisfactory arrangement whereby the contractor sends a report of all accidents, loss or damages involving the utility's properties and property of others. The form of these reports is similar to regular accident reporting forms. In some cases a copy is sent by the contractor to his insurance company in lieu of the insurance company's regular form. With these reports on hand it materially simplifies the problems of the utility's claims representative in handling these matters.

There have been occasions when the utilities are jointly involved with the contractor in the proximate cause of an accident. In these cases the insurance carrier for the contractor and the utility's claims department agree on a proportionate contribution for the payment of damages. To this end it is important to obtain the cooperation between the adjusters for the insurance companies and the utilities.

Some utilities have formal agreements with employees, engaged in work which requires the regular use of a passenger car, for use of their owned automobiles. In addition to other terms and conditions the employee must provide and maintain at his own ex- (Continued on page 46)

Attention photographers!

• Have you taken any unusually artistic or striking pictures of gas industry operations? If so, here's an opportunity to receive industrywide recognition of your talents. The 1951 A. G. A. MONTHLY frontispiece contest is now open to all photographers who are members of American Gas Association or who are employed by member companies.



• Copies of the MONTHLY bearing the winning pictures on the cover are distributed each month throughout the gas industry in this country, Canada, and many foreign countries.

• Prizes are ten dollars for each photograph selected for publication as a cover illustration. Photographs will be selected principally for their pictorial excellence but must be related

to the gas industry. Artistic expression of gas industry operations and the personal elements are desired.

• Contestants should submit glossy black and white prints not less than eight by ten inches, unmounted. Vertical rather than horizontal pictures are required. Please look at past frontispieces of the MONTHLY for general style before entering the competition.

• Each entry should be accompanied by a 25-word caption.

• Photographs that have not appeared in other publications are preferred. However, no restriction will be placed on the photographer's use of entries following appearance in the MONTHLY.

• Please send all photographs to: American Gas Association MONTHLY, 420 Lexington Ave., New York 17, N. Y. Be sure to exercise care in wrapping so that entries will not be bent or otherwise marred.

*New publications discuss large single-port burners,
non-aerated blue flame burners and burner
flexibility without readjustment*

Research in the news

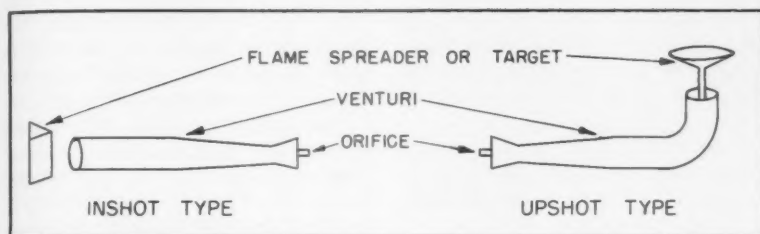
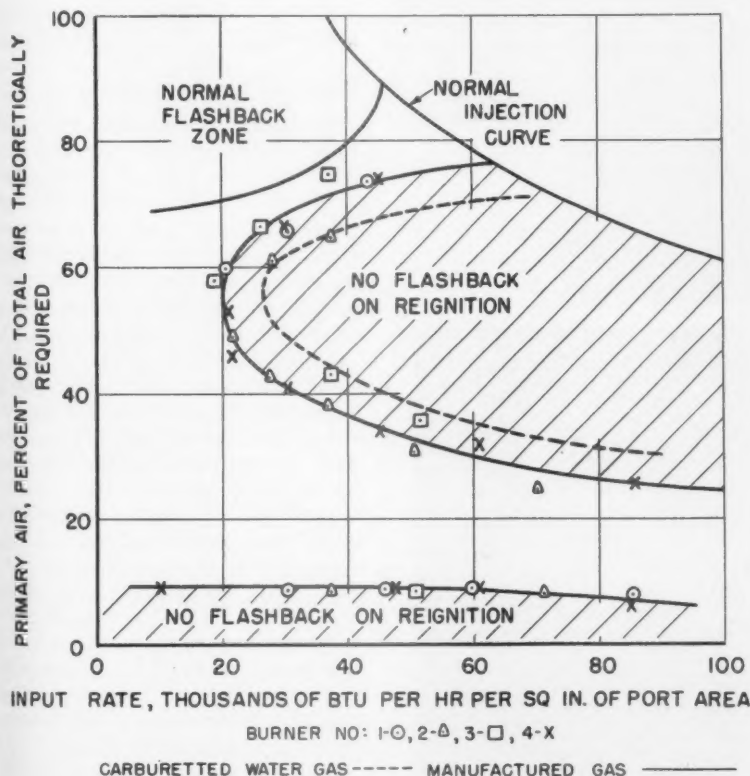


Figure 1 (above). Two general categories of large, single-port burners—the inshot and upshot types. Figure 2 (below). Limit curves for flashback on re-ignition for upshot type burners studied at A. G. A. Laboratories. Research Report 1167 covers the study of seven large, single-port burners of the conventional type used in central heating



a PAR activity

Three general utilization research projects concerning specialized types of burners and phases of burner design are reviewed in separate studies recently published by American Gas Association Laboratories. Previously there had been only limited technical knowledge in these fields.

One of the publications embraces a study of large, single-port burners of the conventional type employed for central heating purposes. These burners have enjoyed increasing popularity during the past few years.

Another study covers comprehensive exploration of non-primary aerated blue flame burners which have been utilized widely in other countries. Such burners mix all the air needed for blue flame combustion after the gas issues from the burner ports, instead of premixing part of the air with gas within the burner.

A third study analyzes burner design factors associated with obtaining maximum burner flexibility without readjustment so as to permit wider variations between base and peak load sendout gases.

Titles of the new publications are: Research Report 1167, "A Study of Large Single-Port Atmospheric Gas Burners—Flashback Characteristics on Ignition;" Research Bulletin 62, "A Study of Fundamentals of Design of Non-Primary Aerated Blue Flame Gas Burners," and Research Report 1170, "Study of Burner Flexibility on Various Base and Peak Load Gases." All were conducted under the PAR program and sponsored by A. G. A. Committee on Domestic Gas Research.

Large single-port burners

Increasing use of large, single-port atmospheric burners, especially for conversion house heating, has created a need for fundamental design and performance

information comparable to that existing for conventional burners with many ports. In initiating such studies, Report 1167 analyzes the conditions under which flashback on ignition is likely to occur. Seven contemporary burners were studied. Single-port burners are classified into two general categories—upshot and in-shot (Figure 1). Such burners may have gas input ratings as high as 350,000 Btu per hour or as low as 40,000 Btu per hour.

The natural limits of flashback on ignition inherent with each large port burner were determined first by establishing the limiting values of burner input rate and primary air adjustments which were free from flashback on ignition. Burner design factors then could be varied to establish their effect upon each burner's natural limits.

Contrary to established principles of design for multiple-port burners, it was found that for all practical purposes variations in design of large, single-port

burners will have little effect on the normal flashback limit of the burner for the gas being burned. The flashback limit with any one gas was the same for all of the burners. This apparently is because the comparatively large port size employed is the major factor in determining flashback characteristics. Consequently, the report indicates that where flashback with such burners becomes a problem, one must look for the solution to factors other than those of burner design.

As a general conclusion, the results of the study indicate that burner adjustment and burner placement in the appliance affect flashback on ignition more than burner design. Limit curves showing the zones in which flashback does not occur, in terms of input rate and primary air adjustment for the burners studied, are presented in the report.

In addition to occurrence of flashback due to input rate and primary air adjustment falling within the normal flashback

zone of the burner, it may also be caused by other conditions. It may occur on re-ignition and after long off-periods of the controlling thermostat.

Flashback on re-ignition was found to occur as the result of either a short thermostatic cycle, a chattering thermostat or a leaking control valve in the burners studied. Under these conditions, when gas is shut off, a flashback on extinction may ignite residual gas flow at the orifice. Consequently, the burner may be operating in a flashed-back condition at the time the re-ignition takes place. The characteristics of flashback on re-ignition for upshot burners (an important factor) was found to differ somewhat from those for inshot type burners. Figure 2 shows zones where no flashback on re-ignition occurs for upshot type burners investigated.

Flashback on ignition due to long thermostatic cycles was found to be a function of the gas manifold volume downstream from the control valve. It may be avoided by designing the manifold for the smallest possible volume. During the off-period air diffuses into the manifold and a lean mixture is produced at the port at the time of ignition. Diffusion may be minimized by placing the orifice below the level of the manifold with fuel gases lighter than air. With heavier gases relative positions of orifices and manifold would have to be reversed.

Non-aerated burners

Application of non-aerated blue flame burners to appliances has been limited in this country, and has been largely on an experimental basis. Large quantities of natural and mixed gases are distributed here. These gases tend to be slower burning than manufactured gases and consequently not as readily adaptable to such applications as is manufactured gas.

Little information has been available on how individual design factors affect the performance of non-aerated burners and on changes in design which could be made to bring about satisfactory performance and operation under a variety of conditions. Therefore, a study of the subject was authorized.

Research efforts were directed especially toward burners which mix sufficient air with the gas issuing from ports to produce blue flames. Studies included commercially available English burners, and experimental slotted port and drilled port burners developed at the Laboratories for studying design factors.

Primary advantages of non-aerated

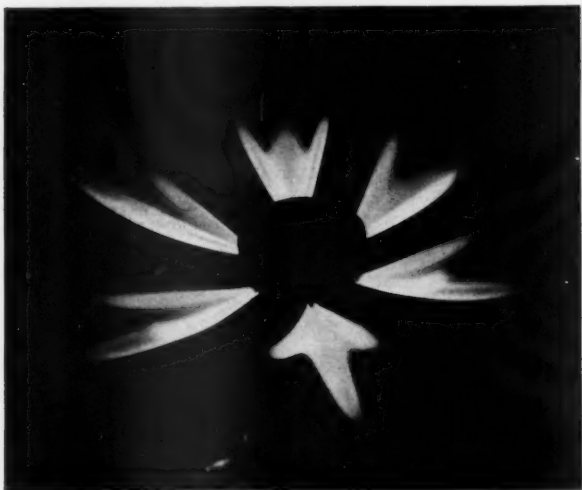
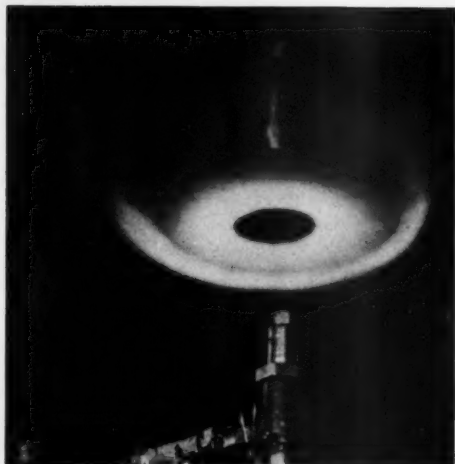


Figure 3. Typical thin, fan-shaped gas flames of large area achieved with slotted ports, increasing aeration of the flame when burning manufactured gas

Figure 4. Flame pattern produced by burning natural gas against an impingement target, thus permitting use of larger drilled ports



burners employing fast burning gases are compactness of size, elimination of primary air openings, mixer tubes and orifices, complete absence of flashback and noise of extinction, quiet operation and wide range of turndown. Since ports usually are very small they are apt to become obstructed by foreign materials. Slotted ports were found to increase the surface area and aeration of flames beyond that normally attainable with conventional drilled ports. Thin fan-shaped flames of large area were achieved as in Figure 3.

For the utilization of natural and other slow-burning gases, impingement targets were employed in conjunction with burners having drilled ports, allowing the gases to burn at the targets in a "lifted" position. This permitted larger ports than is possible with slotted ports and the use of burners fabricated from conventional materials. Figure 4 shows a typical flame pattern at impingement target.

Limited tests with domestic gas-burning appliances and experimental combustion chambers indicated that appropriate burner design of both types studied will give satisfactory performance at full input rating on any one gas. As indicated above, different burner designs are required for natural and manufactured gases. A procedure of locating burner ports outside the combustion chamber proper proved effective in removing the ports from regions of high ambient temperature. It provided for cooling of the burner head by combustion air with the ports shielded from excessive drafts. Figure 5 shows drilled port burner installed outside combustion chamber.

Burner flexibility

Flexibility of contemporary multiport burners, desirable for meeting variations in sendout gases due to peak load or emergency conditions, involves the study of flame limit curves not only for flashback, but those for lifting and yellow tipping as well. Characteristic limit curves for all three are shown in Figure 6.

Report 1170 is a progress report on phases of burner research that seek to learn the direction of design trends necessary to achieve better flexibility under various conditions of application.

An analysis was made of critical burner performance data obtained during the course of project TL-1, "Mixed Gas Research," reported in Research Reports 1106-A-B-C and D was made. Single elements of design could not be isolated. However, it was determined

that burner flexibility is dependent on the original burner adjustment as well as on design characteristics affecting lifting, yellow tipping and flashback of flames.

On the basis of the information studied, and the insight gained from 17 burners analyzed, further research was planned and is now in progress. The work involves exploration of the effects of port size, port spacing and port direction on flame stability. Flashback, lifting and yellow tip limit curves have been determined for a series of experimental burners affording a variation in port design and arrangement.

Thus far a theoretical consideration of the curve suggests that the effect of any variation in a given burner on its lifting and yellow tip limit curves is constant and independent of the burning characteristics of the gas being burned. In short, if some variation in a burner displaces the lifting limit of natural gas by a given amount, expressed in percent pri-

mary air, it also will displace the lifting limit of any other gas by the same amount. It is proposed to apply this conclusion in determining the effect of burner design on flexibility as follows: Hard, medium and soft flame adjustments for a given burner and given gas can be determined from the limit curves. From these three adjustments, predictions can be made as to the shifts in burner adjustments which occur when a gas of different composition is supplied to the burner. Comparing these resultant adjustments with the flame limit curves of the substituted gas should then indicate the degree of flexibility of the burner. Repeating this procedure with a series of burners and gases should permit identification and evaluation of principal factors influencing burner flexibility.

The three research publications are available from A. G. A. Laboratories. Research Bulletin 62 is \$1.50. Reports 1167 and 1170 are 50 cents each.

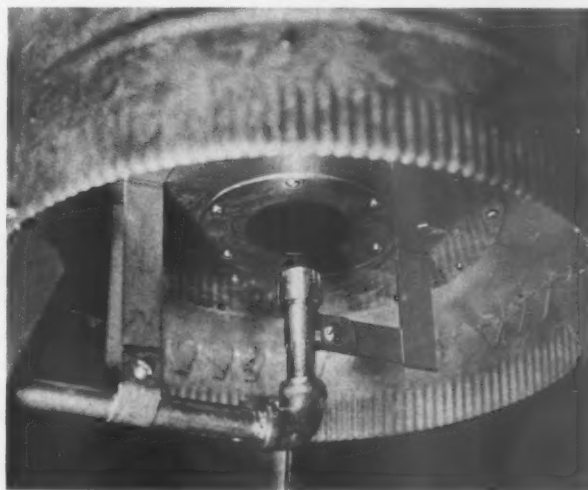


Figure 5. Close-up of non-primary aerated burner installed outside the combustion chamber, removing burner port from the high temperature zone

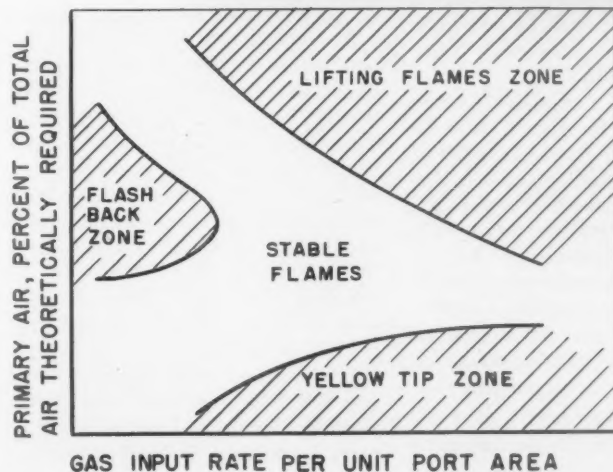


Figure 6. Characteristic limit curves for lifting, yellow tipping and also flashback of contemporary multiport gas burners

Texans prove that crisis breeds unity

Swift action by Lone Star employees and local citizenry an epic example of how emergencies should be handled

● Following story is the first in a series of "case history" articles supplied by members of the Publicity & Advertising Committee of American Gas Association.

Crisis in the utility business does breed unity! They proved it in Central Texas on February 3 when Lone Star Gas Company's 16-inch main from Waco went out unexpectedly.

The story is an epic example of how an emergency should be handled. It is the story of men imbued with the spirit of service and the realization that in a blizzard time means fuel—food—life!

Otis Hopson, ex-farm boy, acted swiftly when the line went out. A short-time Temple gas company crew man, he had no telephone and probably had never heard the word "unity." But he snatched on his clothes and stumbled out to his pick-up truck in the 17-degree air.

It was three miles to town. In about

Based on an account by Kenneth Force in The Dallas Morning News.

four minutes, he was beating on the door of Dave Kitchens, assistant crew foreman. Kitchens found a wild man hobbling in half-on boots.

"Smatter? You broke both ankles?" he asked.

"Main line's blown," Hopson blurted.

Kitchens ran to his phone, bellowed to John Brown, pipeline assistant foreman. Brown bellowed: "You're closer to the city gate. You shut it. I'll get the Troy gate."

Kitchens and Hopson jumped into the latter's truck and drove to the city gate which they shut off. The first victory!

But there were two other battles to be won—repairing the break and holding the previous penned up gas.

Things happened fast. Kitchens phoned Temple manager, George Peck and his own crew foreman, Hank Driscoll. John Brown, after shutting the Troy gate, called Eldon Glenn, Waco district pipeline foreman. Glenn ordered two crews from Waco. Driscoll and Brown

assembled men to excavate around break.

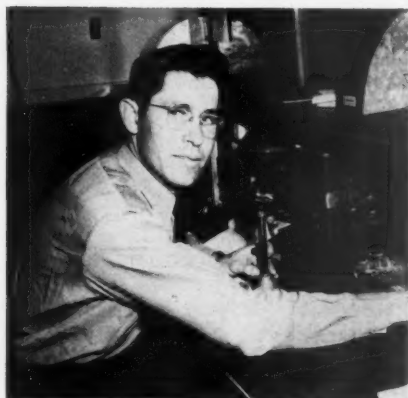
Peck leaped into his clothes, pointed at numbers on his wall, shouted to his wife to phone the men, and ran for the office. There, Louis Tally, installation foreman, asked: "Want to get the police to help?"

Police are men of action and you don't have to ask for unity. Dispatcher Perry spoke into his mike. One car sirened up to the gas company office to escort local crews to the break. Another screeched northward to meet and escort the crew coming from Waco.

But the great battle was to hold the gas. Only the uninformed customers could do that. Salesman J. D. Price suggested, "Get the Roberts Sound Service." Walter Roberts was snoring. But in ten minutes he raced up with a sound truck



1 Otis Hopson, Lone Star distribution employee, sounded alarm when pipeline went out near his farm home. He had no telephone, but raced to town in his truck in record time



2 Perry Johnson, police radio operator at Temple, assumed responsibility for early assignment of patrol cars in line emergency. He also relayed messages from squad cars to utility office



Sergeants Wiggington and Shearon of Temple police department took part in early morning race against time. Other officers were assigned and remained in service of gas company until emergency was over



5 Pipeline men from gas company's Temple headquarters were first to arrive at the break. Waco crews and Temple distribution men joined them to repair break in time to save all but three percent of customer service. Shown above are H. E. Lancaster, D. G. Pond, George Ross, John Cearley, W. H. McDaniel. C. J. Breeland waits in the Lone Star emergency truck



Walter Roberts in one of the four sound trucks that warned residents to conserve gas. Three of the units were mounted on private cars, one of which was manned by Lone Star employees and others by the police



6 Distribution employees at Temple celebrating after service was restored: J. N. Brown, industrial engineer; L. C. Talley, installation foreman; George F. Peck, Jr., district manager who supervised local emergency work after Waco main went out; J. D. Price, Servel air conditioning salesman, and D. L. Kitchens, assistant district foreman for Lone Star Gas Co.

that could knock a man out of bed. He also brought smaller units for passenger cars which Engineer Harold Umberger and Draftsman Roy Jennings took over.

Out at the gate, Driscoll had been watching the pressure gauge drop. It dropped 26 pounds more to 194 in 15 minutes. Then he heard a hubbub:

"The main line has broken. Do not use gas unless absolutely necessary."

No one mentioned unity, but Mayor C. L. Walker, Jr. appeared at the Lone Star office. He wrote out a proclamation asking people to save gas. Burton Bishop, Radio Station KHEM manager, appeared, took the proclamation and put it on the air. Telephone Company Manager Crittenden told operators to break into every conversation with "Conserve gas."

Out at the gate Driscoll grinned. That fatal gauge had quit plummeting.

Temple was the biggest problem, but Waco Division Superintendent A. P. Rowland was notifying all other towns.

At Killeen, W. E. Lyons, new manager of the Mid-Texas Telephone Co.; appealed to by W. L. Routt of Lone Star, ordered his chargers turned up "even if we blow a fuse," and instructed his operators to call everybody in the book.

The same thing happened at Taylor, and KTAE Radio Station Manager Gillis Conoley made appeals every 15 minutes. WFAA at Dallas, KTBC at Austin and others helped. But at Fort Hood Maj. Gen. A. A. Smith got an early radio report and long before Lone Star reached him had shut the gate.

All over Central Texas people went without breakfast or ate cold left-overs, wore overcoats in their homes, called the gas company: "What can I do to help?" Cafes had no hot food, stores stayed cold.

Nevertheless, the pressure at 9:05 a.m. showed not the average 290 pounds but a tiny 19. Taylor had five minutes of gas left. Just then the Temple police car standing by the bundled crewmen fighting a sleeve over parted pipes came on the air. The car at the Troy gate heard: "Turn'er on."

The pressure went up, up, up. At noon radio stations said "The emergency is over. The main has been fixed."

Central Texas had won a war and no one had said anything about unity.

How to merchandise your annual report

By H. GRAHAM SMITH

*Stockholders Relations, Inc.**
New York, N. Y.

Make your annual report work for you. New financing requirements of the next several years and uncertainties as to equitable gas rates mean that the public utility industry must sell itself more solidly to the investing public and its customers.

As long as you are required by statute to spend time and effort in producing an annual report, why not use this medium as an important sales aid to make your company better known?

Too many utilities have their names appear in the financial communities only when they are seeking funds. After completion of a financing, investment advisors don't hear from many of these companies again until they are forced to come back to the street with their hands out for aid. Still other utilities have learned a lesson from experience. They have found that proper merchandising of their annual reports is a singularly effective way to keep the company's name before the investment advisor and supply him with factual up-to-date information about the company.

This growing awareness of the annual report's value is all part of a tremendous transition that has occurred in financial reports during the last decade. In 1939, most annual reports were stuffy, replete with legal and accounting terminology that confused rather than helped the average reader. You will find an amazing change in most 1950 reports. The majority are modern, well-illustrated and written in simple language that is readily understood by the average stockholder.

Annual report contests of organizations such as *Financial World* and Public Utilities Advertising Association have speeded the tempo of modernization by encouraging competition. But major contributing factors have been the improvement in financial education of the public, establishment of social reforms, a better knowledge and understanding of



Photo courtesy Union Oil Co. of Calif.

* Management consultants specializing in the utility field.

mailing lists for annual reports can "sell" your company to customers and investors

capitalism, and management's realization that annual reports can be made to work for the common good of both stockholders and themselves.

According to Weston Smith, executive vice-president, *Financial World* magazine, only six percent of the annual reports examined in 1940 could be classified as modern. At the same time, 16 percent of the reports examined were improved over the previous year. However, a surprisingly high 78 percent of the reports remained unchanged. Compare these figures with those of 1949 when 52 percent of the reports were found to be modern, 28 percent were rated as improved, and only 20 percent remained unchanged.

Suggestions that I am about to make can be utilized to fullest extent by public utility companies that issue modern reports. However, these remarks should be helpful also to the minority (though not to the same degree).

Stockholders first

Your first list of report recipients naturally should be your stockholders. Your stock list can be made to work for you more effectively by a careful examination of all institutional names, such as dealers, brokers, banks, nominees, trusts and insurance companies. Stock held in the name of one broker actually may represent dozens of individual accounts. Also, some firms and institutions like to obtain copies of annual reports for the exclusive use of their libraries.

It may surprise you to learn that the largest private file of annual reports in the country is not owned by the New York Stock Exchange or even a large bank, but by a library. The Marvin Scudder Financial Library at Columbia University has the annual reports of about 500,000 corporations dating from as far back as 1821. Each year, approximately 4,000 corporations send their reports to this library which is used by business researchers and students alike.

What steps are required to merchandise your annual report affectively? For one thing, it is good practice either to:

(a) Write in advance to the institu-

tional names mentioned above. Ask them how many copies of your annual report they would like to receive. Enclose a reply card, or

(b) Enclose a notice in the regular annual report mailing.

Nowadays it is standard practice to establish a special annual report mailing list. Based upon the premise that any list, other than your stock list, is a "special mailing list," it will be to your advantage to review the list in the following manner (in the order of importance best suited to your individual purposes):

(1) *Labor*—Your union heads, foremen and important labor leaders should receive copies of the same report you send to stockholders. You might make copies available to all your employees who are interested. If you do not do so voluntarily, you may be assured this very important "public" will obtain reports anyway, and be less likely to believe what they read. The subject of special reports for employees will not be discussed at this time because it is so controversial that it easily could be made the object of a separate study.

(2) *Dealers, brokers, investment advisors, trusts, insurance companies, banks and institutions*—These people advise at least 90 percent of your investors and potential investors, either directly or indirectly. They are the people to whom you will go for new money of every kind. "Security Dealers of North America," published by Herbert D. Seibert & Co., Inc., 25 Park Place, New York 7, N. Y., will be useful in obtaining the names of dealers and brokerage firms that specialize in the stocks of public utility companies.

(3) *Financial rating agencies, investment and management advisory services, engineering firms and services*—These people influence an important segment of the national economy which controls the price you pay for the use of money.

(4) *Security analysts who specialize in public utilities*—The members of this profession are perhaps the most important of your immediate "publics." They advise the people in categories (2) and (3).

To help select your list of security analysts, you might refer to a "Directory

of Memberships" issued by The National Federation of Financial Analysts Societies. Copies can be obtained at two dollars each from Albert P. Squier, director, New York Institute of Finance, 20 Broad St., N. Y. 5.

Affiliated with the National Federation are:

Boston Security Analysts Society
Investment Analysts Club of Chicago
Analysts Club of Detroit
Los Angeles Society of Security Analysts
Montreal Institute of Investment Analysts
New York Society of Security Analysts, Inc.
Financial Analysts of Philadelphia
Providence Society of Financial Analysts
St. Louis Society of Financial Analysts
Security Analysts of San Francisco.

The Directory of Memberships lists all of the analyst members, their firms and addresses. When selecting names for your list, do not include all of the analysts, because only a small percentage are interested in your business. Include, however, those analysts who specialize in public utilities, whether or not they are affiliated with a firm or institution that you know is interested in your securities. Also include the top analyst of all firms you know or have reason to believe are interested, regardless of whether or not he specializes in your field.

Inexpensive means

(5) *Your important industrial and commercial customers, plus your civic accounts*—You are constantly striving to continue a cordial relationship with these people. So why not take this inexpensive means of showing them how little you actually are allowed to profit upon each dollar?

(6) *Local, state and federal agencies* also are interested in your corporate health. Add the names of the alderman, mayor, other civic officers, your state and local senators and representatives for the areas you serve, the State Department, including your Governor, Secretary of State, State Treasurer, Attorney General, head of the Tax Department, all of your

PUC members and members of the Federal Power Commission.

It will be much to your benefit to make it possible for your "government" to become familiar with your identity, the areas you serve, your problems and requirements. As they are the elected representatives of the people, you should strive to keep them aware of the earnings status of your properties, the impact of inflation, the cost of labor and the cost of money, all of which will affect your rates.

(7) *Include educational leaders* in the areas served, the *principals of all schools*, including elementary, high schools, colleges and universities, and the *pastors of all churches*. Educators are also molders of public opinion who should be made more familiar with the important part the local public utility contributes to the welfare of the community. They should have the facts regarding public vs. private ownership spelled out to their satisfaction. And they should have a chance to appreciate the benefits they are deriving daily from our democratic form of government. The educational leaders of today are the public opinion molders of the next generation.

(8) *Opinion leaders at your local community levels*, such as the Chambers of Commerce, Rotary, Kiwanis, Lions and other businessmen's clubs—These organizations comprise most of the local opinion leaders who should be made more familiar with the gas company that is so indispensable to their daily welfare. Their good will is a valuable asset to cultivate. It will be useful in many respects, including your dealings with public utility commissions.

(9) Also interested in having copies of your annual reports on file are your *local libraries*, the *public libraries in the major cities* of your part of the country, plus the *New York, Chicago, Boston and Philadelphia public libraries* and the *Congressional Library in Washington*.

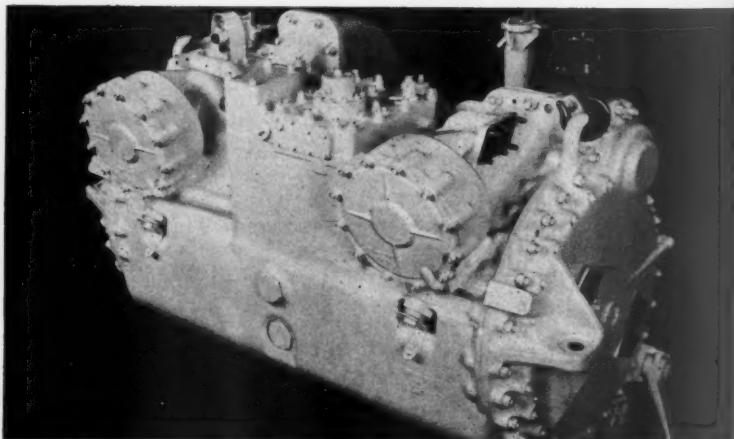
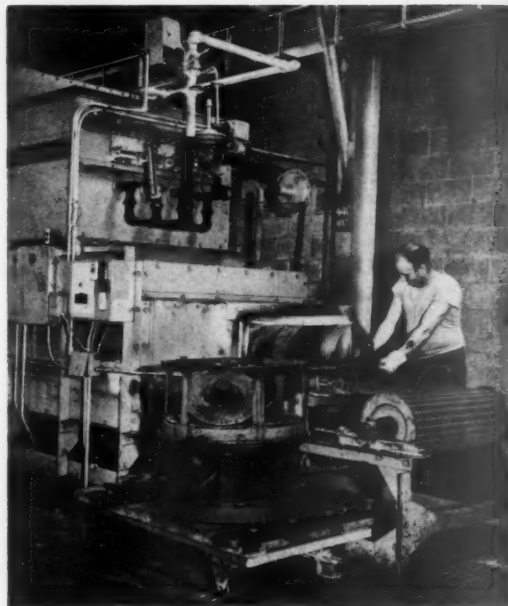
(10) *The press* also should receive your annual reports. This term includes all newspapers located in your territory, plus *The Wall Street Journal, New York Journal of Commerce, The New York Times* and *New York Herald Tribune*. Publication of your earnings reports will help to keep your name before the investment advisors.

(11) *Better-known financial publications* that should be considered in connection with (10) above are: *Financial World*, (Continued on page 47)

Defense production speeded by gas



GAS GOES TO WAR: This is the M-46 General Patton medium tank now rolling off production lines in increasing quantities and tagged for Korea. The 3,000-pound, dual-control transmission is made at Allison Division of General Motors Corporation and many of the gears and steel parts in the assembly are heat treated by gas. Operator of gas heat-treating furnace at right is feeding conveyor with gear blanks at the Allison plant. Finished gears go into the Patton tank transmission. Photos courtesy "The Gas Flame," Citizens Gas and Coke Utility, Indianapolis



*Every effort must be made to prevent
a new breakdown of manner, morale and methods*

Morale—target for defense

By CHARLES L. DIGIOVANNI

Laclede Gas Co.
St. Louis, Mo.

● Mr. Digiovanni's article was prepared especially for the MONTHLY as an activity of the Editorial Committee of the Accounting Section. The author is currently chairman, Customer Relations Committee, A. G. A. Accounting Section.

The effect of World War II on public morale has not been forgotten. The effects of another war could be disastrous. Obviously, business can and should play an important role in building good public morale. Every effort made to establish good public relations is a step towards this goal.

Before 1941 and the period of the "sellers market" clerks were real sales people. If they sold tangible merchandise, they also built good will for their company by courteous, solicitous treatment of customers. Clerks and other customer contact employees sold the services of their company to the public.

Then came the war—demand outgrew supplies, both in merchandise and manpower. Clerks were no longer sales people—they became order takers, who took orders when and how they pleased. If you didn't like it, so what! Selling and good will building were things of the past. The effect this would have on the future was ignored.

The public did not forget, however. They remembered the times when they were belittled, mistreated and, in some instances, practically insulted. They made mental notes and when a choice could be made they avoided those sales people and companies from which they had received rude treatment.

How many times did you hear the expression, "Don't you know there's a war going on?" Everyone realized that

the whole world was throbbing to the throes of a great catastrophe, but what good came of adding to the unhappiness of people by pushing them around, making them resentful and wanting to push back? It was only natural that such discourteous service or treatment rankled.

When the war ended, a great need was felt to re-educate and train employees so that they would realize the importance of good customer relations. Lackadaisical attitude had to be replaced with prompt, courteous, individual service to the customer. Many companies spent a great deal of time, effort and money on training programs which they hoped would have a lasting effect.

Now we are faced with the possibility of another World War. Whether or not a war develops we are faced with a period of short supply in both manpower and equipment. What can be done about future customer relations? Will we lapse back into that "You can take it or leave it" attitude of the clerk toward the customer? Is it possible to avert this? Perhaps not completely, but every possible effort must be made to forestall and prevent a recurrence of a breakdown of manner, morale and methods.

In times like these, public morale is of great concern to the entire nation. If we consider how much ill will, contempt, dissatisfaction and hardship was the out-



"You said things are getting so tough pretty soon we could sass the customers again, but I couldn't wait!"

St. Louis Star Times

come of poor service, and then add that to the general unrest and the uncertainty of atomic threats, it is not hard to realize that everyone is under terrific tension. This tension has been mounting ever since the beginning of the Korean situation. It will become a civic duty to help build good morale. If good service helps, we as good citizens must do our part.

Nearly everyone knows how he likes to be treated. When we seek service, we want "good service." No matter how unimportant it may seem to the clerk or others involved in giving this service, it is very important to us.

Suppose, for example, that you start the day with a light breakfast, maybe toast and coffee. This is a very insignificant order to the waitress and to the restaurant, but it is important to you. If the coffee is savory, hot and satisfying, the toast golden brown and tasty, and if it has been properly served by a courteous, appreciative person, your day is off to a good start. But, put this in reverse—weak, tepid coffee; limp, burnt toast; served by a slovenly, discourteous, unfriendly waitress—what a start like that can do to your day!

Service first

Now, add scarcity conditions to this illustration: Coffee is a wartime mixture, sugar is rationed, help is scarce. You realize these things, you know that no one person is to blame. But nevertheless your breakfast still is important to you. Like most people, you are not unreasonable. If coffee must be a mixture, at least let it be hot with as much sugar and cream as possible. Let the service, if it has to be slow, be polite and efficient enough to make up for the delay.

If we see that every effort is being made to overcome obstacles so that we can receive the best possible service, we cannot help but be appreciative.

In the gas industry, we do not serve coffee, but the basic principles are the same. Each customer calling upon the company for service feels that his problem is important. It is important to him and should be important to whoever serves him. That is true whether it is an application for service, purchase of appliances, request for adjustment, complaint, or payment, etc., and whether or not we are at war.

As we move deeper into emergency conditions, let us prepare to meet them. If we start to prepare now we shall find, as in actual warfare, that preparedness is

a great bulwark. Good public morale will be a strong weapon—stronger than subversive propaganda.

A definite program is needed to build good morale. The program might be as follows:

- (1) Explain the program to every employee so that he understands it completely. Show him:
 - a. Why it is being staged.
 - b. How everyone is affected.
 - c. Results, if successful, and if not successful.
 - d. An outline of the program.
- (2) Check the material on hand. Review previous training, such as refresher courses of great value, and changes, revisions, additions.
- (3) Morale building—an offensive campaign against war nerves.
- (4) Steps to be taken when the emergency is over.

Good habits formed during this campaign will be cherished souvenirs with which we will not want to part.

Ré-adjustment to normalcy will be easier if we have protected our customers' good will and good fellowship among employees.

If the servicemen who are giving up everything for us knew that we were trying to make things better for their loved ones—building, not destroying, their morale—it would help their peace of mind. It is just another case of chain reaction, and chain reactions can be very powerful—atomic research has proved that.

This campaign will, in a sense, be a war against intolerance, impatience, discourtesy and unfriendliness. Here is the program in more detail:

(1) *Explain the campaign to every employee:* Include every member of the company. If department managers expect their employees to build morale, they must practice it with the employees. If officers expect the department heads to see this through, they must practice it with the department heads, etc. It must be an all-out campaign.

a. *Why it is being staged:* During the last war there was a breakdown of customer relations. Experience proved the very damaging effect this had on public morale.

b. *How is everyone affected:* This can be explained best through a series of illustrations. Preferably, have the employees give examples of how they were mis-

treated during the last war and how they felt about it. Then have them tell how they were treated properly, especially the exceptional cases, and how they reacted.

To get an idea of how this would work out, I tried it on a group of friends. They started by describing the arrogance of butchers during meat rationing. Before long the gas company came in for its share of both the "good" and the "bad."

Tillotson said, "When we have practiced good actions awhile, they become easy; when they are easy, we take pleasure in them; when they please us, we do them frequently and then by frequency of the act, they grow into a habit."

If we practice good morale it will become a habit which will make better customer relations and better working conditions.

c. *Results if successful—and if not successful:* It must be successful. Public morale must not be permitted to drop to a new low. Unless something is done, the breakdown of customer relations in the last war will, by comparison, seem just a slight case of nerves.

For the duration

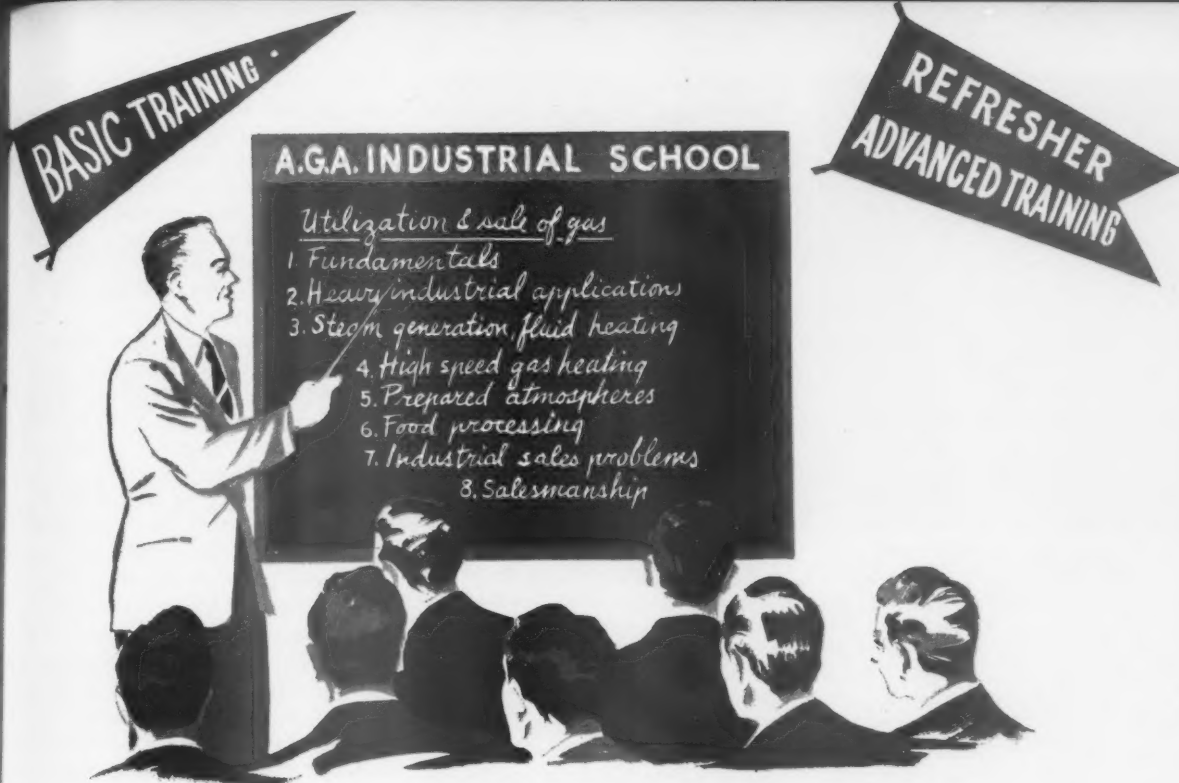
If successful, each person directly or indirectly responsible, can feel that he played a part—he was a civilian soldier whose armor was a smile, a kind word, and a sincere desire to help his fellow man. He fought and overcame his enemies, indifference, discourtesy, unfriendliness and intolerance.

d. *Outline of campaign:* There can be no let up in this campaign; it must be for the duration.

Constant training seems the only way. Here are a few of the many training methods adaptable: class instructions, speakers, conferences, educational movies, bulletins, posters, displays—exhibits, newspaper articles, company magazine articles, competitive projects and advertising.

Some of the things that could be taught are:

- a. Self control and tolerance.
- b. Courtesy—manners, when to use them; how and why.
- c. Think first of the other fellow. Try to make his life richer, understand his problems, thereby strengthening his friendship and deepening his appreciation.
- d. The value (Continued on page 45)



School bell calls industrial men

Five days of intensive technical training will be held, May 14-18 at the Hotel William Penn in Pittsburgh, for men who promote or sell gas for heating operations of industrial processes. Known as the 1951 A. G. A. Industrial Gas School, the course has been planned by the Section's Sales Training Committee. Terry Hart, Nashville Gas and Heating Co., Nashville, Tenn., is chairman of the group.

Subjects at the school have been organized to provide basic training for new men in the industry and at the same time, refresher and advanced training for more experienced personnel. Students attending the sessions will be provided valuable technical knowledge on the application and servicing of gas for their industrial customers. Such information should help to increase their ability to present the advantages of gas fuel to industrial management.

Instruction will be given in the utilization and sale of gas for industrial purposes under the following headings: fun-

damentals; heavy industrial applications; steam generation and fluid heating; special applications, including high speed gas heating, prepared atmospheres and food processing; and industrial sales problems and salesmanship.

Lectures will be conducted strictly on schedule by experienced men with specialized knowledge of their subjects. Discussion of principles of the combustion of various fuels, and the various types of burners and combustion systems used on industrial gas equipment will be led by Jack Huebler, Surface Combustion Corp., and H. F. Rehfeldt, The Peoples Gas Light & Coke Co., respectively.

Mathew H. Mawhinney, well known consultant, will outline a practical approach to heat balance, heat transfer, furnace and burner capacity in industrial furnaces. The important subject of temperature measurement and control will be covered by an outstanding authority from Leeds & Northrup Co., J. L. Garrison. Protective practices, a companion subject, will be presented by Claude A.

Gates, Wheelco Instruments Co., one of the leaders in the field of equipment for ignition and combustion protection in industrial gas applications.

Of special interest to students attending the school will be heavy industrial applications of gas. A number of experts have been selected to share their knowledge on the general principles of heat treating and the equipment used for this purpose. They also will discuss equipment for forging, pressing and extruding metals and alloys; design of ovens, application of air heaters for drying and finishing. Non-ferrous metal melting and the various types of furnaces to do this job also are on the program. Other subjects scheduled include manufacturing operations and problems involved in the uses of gas fuel for ceramic kiln firing and in the manufacture of glass. Lecturers for these subjects will be: Carroll B. Mer-shon, Continental Equipment Co.; Hale A. Clark, Michigan Consolidated Gas Co.; J. D. Russell, Young Brothers Co.; R. A. Hastings, Continental Industrial

Engineers, Inc.; Dr. J. T. Robson, Ferro Enamel Corp., and Aaron K. Lyle, Hartford-Empire Company.

More and more industrial gas men are being called upon to solve problems of gas fuel applications to boilers. One entire day of lectures is to be devoted to steam generation and fluid heating. David M. Barrett, Washington Gas Light Co., Washington, D. C., will explain boiler classifications. A. D. Wilcox, Eclipse Fuel Engineering Co., will talk on commercial boilers used for heating and process steam with recommendations for sizing gas-designed boilers to the job and conversion burners to boilers.

Fire tube boilers, including package steam generators and the more common types of larger fire tube boilers and problems which the industrial gas engineer may meet when converting them to gas fuel will be led by A. D. Frydendall, The Peoples Gas Light and Coke Company. A special lecture on converting power plant boilers and steam generators above 500 hp will be given by L. S. Reagan, Webster Engineering Co., one of the larger manufacturers of burners for this type of boiler.

Much has been written and said on gas air conditioning. One field in which the industrial gas engineer may profitably promote the use of gas is for process air conditioning. Many products require special plant conditions obtainable only by means of air conditioning. Floyd B. Ney-

hart, Carrier Corp., will discuss the use of gas for this purpose. To complete the fluid heating subjects, Maurice J. Dewey, Dewey Gas Furnace Co., will lecture on methods of immersion heating, external heating and submerged combustion for water and other solutions.

Special applications will be covered in a series of lectures. Gas men probably encounter more situations in this category than in any other. A description of localized flame and high head radiant heating and the advantages of high speed gas heating will be one of the subjects. Others include: prepared atmospheres, their generation and application for various industrial operations and the results obtained through their use; uses of gas in textile and paper processing, with a description of typical installations of gas-burning equipment. Miscellaneous small-volume processes covering equipment used for varnish cooking, fume incineration, battery burning, mold drying and ladle heating and large volume food processing, will complete the strictly industrial gas part of the course. These subjects will be presented by: Paul A. Furkert, Gas Appliance Service, Inc.; C. George Segeler, American Gas Association; G. R. Van Kampen, Red-Ray Manufacturing Co.; Carl Wierum, The Brooklyn Union Gas Co., and Stanley M. Lausch, Public Service Electric & Gas Company.

Industrial gas sales problems that are

a vital part of the training of all industrial gas men will be presented at the morning session on the last day. One of the feature events will be a lecture on competitive and standby fuels by Charles C. Eeles, The Ohio Fuel Gas Company. Ralph S. Wenner of the same company will discuss customer relations and how to influence customers. Selling aids, as discussed by Herman Koester, Jr., W. Wirt Young & Associates, will remind the industrial gas man of the tools he has to work with and the best ways to use them. Dynamic Milton J. Firey will climax the entire course and tell the students how to sell industrial gas.

On the afternoon of the last day, an examination will be given during which reference may be made to all the lectures and notes made during the lectures. Shortly after the school, all registrants who have satisfactorily completed the course will be awarded a certificate.

A complete program of the course has been sent to all member company delegates and to all members of the Industrial and Commercial Gas Section, together with registration blanks. In addition to industrial gas men, it is strongly advised that employees of industrial gas equipment manufacturers and dealers together with plant engineers be invited to attend this school. The course should prove particularly valuable to present and prospective industrial customers.

Gas exhibit to be largest at restaurant show

NINETEEN manufacturers of heavy-duty commercial cooking equipment are cooperating with the Industrial and Commercial Gas Section to produce the largest single exhibit at the National Restaurant Exposition next month.

The thirty-second annual exposition will be held this year on Chicago's mile-long Navy pier, May 7-11. Visitors, expected to reach 25,000, will be able to discuss the restaurant business, obtain new ideas for their operations, and view the latest heavy-duty cooking equipment. Gas men will be particularly interested in the many meetings to be held during the week. General sessions topics include such vital subjects as "Government Controls in Business Today," "Economic Trends," and "Trade Promotion." Monday, May 7, will be reserved for equipment and food dealers.

Cooperating in the A. G. A. Exhibit, spanning the pier at the "quarter mile post," will be the following manufacturers: American Stove Co., St. Louis, Mo.; Anetsberger Bros. Inc., Northbrook, Ill.; The G. S. Blodgett Co. Inc., Burlington, Vt.; The Cleveland Range Co., Cleveland, Ohio; Detroit-Michigan Stove Co., Detroit; Duke Mfg. Co., St. Louis, Mo.; Gas Consumers Service, Chicago, Ill.; Groen



A.G.A. Committee on Displays at National Expositions meeting in New York to allocate space to co-operating exhibitors in Combined Commercial Cooking Exhibit at the Restaurant Show: (Seated, clockwise around table) N. E. Loomis, D. H. Goldstein, E. V. K. Schutt, M. A. Combs, A.G.A.; W. D. Relyea, group chairman; E. J. Horton, M. H. Douglas, R. L. McVicar; (standing, left to right) Lewis Barry, Frank Doyle, F. J. Drohan, R. E. Regan, F. J. Feiser, J. C. Pitman, J. T. Heilig, Al Hess and P. C. Grimes

Mfg. Co., Chicago, Ill.; B. H. Hubbert & Son, Inc., Baltimore, Md.; Kewanee Industrial Washer Corp., Kewanee, Ill.; Lyons-Alpha Products Co. Inc., New York, N. Y.; The Malleable Steel Range Mfg. Co., South Bend, Ind.; Market Forge Co., Everett, Mass.; J. C.

Pitman & Sons, Inc., Lynn, Mass.; Robertshaw-Fulton Controls Co., Youngwood, Pa.; Ruud Mfg. Co., Pittsburgh, Pa.; Savory Equipment Inc., Newark, N. J.; Sellers Engineering Co., Chicago, Ill.; and Vulcan-Hart Mfg. Co., New York, N. Y.

Next stop production and chemical



Group leaders for A.G.A. Production and Chemical Conference: G. T. Bentley (left), chairman, Gas Production Committee; A. E. Sands, chairman, Chemical Committee

Two symposiums on safety and new experience in reforming natural gas will highlight the Production and Chemical Conference next month. The conference will be held this year, May 14-16 in the Hotel New Yorker, New York City.

Under the auspices of the Association's Operating Section, the conference will include special Chemical and Production Committee sessions, as well as three general sessions for all conferees. Luncheon conferences are scheduled for the second and third days covering work of the various subcommittees.

Monday morning's general session will convene at 9:45 with G. T. Bentley, Michigan Consolidated Gas Co., Detroit, chairman of the Gas Production Committee, presiding. H. Carl Wolf, managing director of A. G. A. will then welcome the conferees to New York. His remarks will be followed by a talk, "European Developments in Use of Oxygen in Gas Manufacture," by L. L. Newman, U. S. Bureau of Mines, Washington, D. C. "Interchangeability Problems" will be discussed by Edwin L. Hall, director, A. G. A. Laboratories, Cleveland. Last speaker scheduled for the Monday morning general session is E. J. Cleary, Ohio River Valley Water Sanitation Commission, who will speak on "Pollution Control Action in the Ohio River Valley."

The general session will reconvene at 2:00 P.M., when Francis Glover, Boston Consolidated Gas Co., and chairman, A. G. A. Tar Dehydration Subcommit-

tee, will deliver the report of his group. A. B. Lauderbaugh, The Manufacturers Light & Heat Co., Pittsburgh, will present an "Illustrated Primer on Orifice Measurement," and Louis Shnidman, Rochester Gas and Electric Corp., will discuss "Process of Oil Gasification."

An important highlight of the afternoon will be a symposium on safety. This event will feature a skit "Vitalize your Safety Program," by members of the A. G. A. Accident Prevention Committee through cooperation of the National Safety Council. Major topics to be covered in the symposium are "How to Keep a Good Safety Record," by J. W. Carroll, Philadelphia Electric Co., and F. D. Miller, Philadelphia Coke Co., plus a "Technical Analysis of Plant Hazards," speaker to be announced. The day's schedule will close at 5:30 with a social hour.

Parallel sessions of the Chemical Committee and the Gas Production Committee will convene at 9:30 on Tuesday morning.

The chemical session will open with Henry Hakewill, Institute of Gas Technology, Chicago, discussing "Apparatus and Methods Employed for Volumetric Gas Analysis at IGT." Other speakers at this session will be Dr. F. E. Vandaveer, The East Ohio Gas Co., Cleveland, discussing "Natural Gas Purification," and A. E. Sands, U. S. Bureau of Mines, Morgantown, W. Va., speaking on "The Possible Effect of the Expanding Use of

Natural Gas on the Production of Coke and Coal Chemicals in the U.S." Also scheduled are J. Joachim, Michigan Consolidated Gas Co., who will discuss "Odorization Experiences in Detroit." C. E. Farmer, United Gas Pipe Line Co., Shreveport, La., will report on "Production of Marketable Natural Gas with Low Temperature Wellhead Units."

Six production talks

Gas production men will be offered an interesting agenda of six talks on Tuesday morning. J. L. Turnan, Worcester (Mass.) Gas Light Co., will open the session with "Minimum Facilities Required for Unloading Propane and Butane." E. S. Pettyjohn or O. P. Brysch, Institute of Gas Technology, will review "Literature on Coal Expansion." "Unusual Mixtures for Underfiring Coke Ovens" will be examined by C. R. Locke, The Peoples Gas Light & Coke Co., Chicago. V. M. Perry, The Brooklyn Union Gas Co., will discuss a survey of "High Btu Gas Plants."

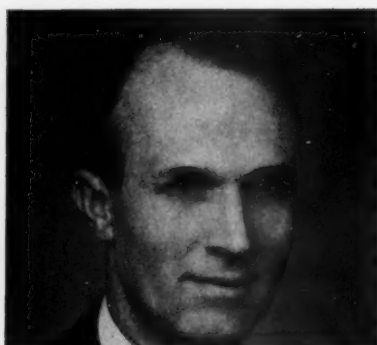
Also scheduled is R. J. Horn, Central Hudson Gas & Electric Corp., Poughkeepsie, who will tell of "Oil Gas Production on the World's First Reverse Flow Regenerative Machine at Poughkeepsie, N. Y." He will describe the set's operation on gas oil and heavy oil and results obtained from substituting high percentages of this gas for natural gas. Last speaker on the agenda will discuss "The Koppers-Hasche Furnace for the



Luncheon meeting leaders at Memphis conference: A. B. Lauderbaugh (left), Use and Handling of LP-Gases; H. R. Batchelder, Use of Oxygen in Gas Manufacture



Gordon G. Howie (left) and Dr. F. E. Vandaveer, who will lead the A.G.A. luncheon conferences on the Manufacture of Higher Btu Gases, and Plant Waste Disposal



Hamilton C. King (left) and G. L. Bixby, Jr., who will be presiding officers for Memphis luncheon conferences on Carbonization and Coke, and Water Gas, respectively

Reforming of Hydrocarbon Gases and Vapors."

Tuesday luncheon conferences, starting at 12:30, will be devoted to the work of three subcommittees.

Subcommittee on Manufacture of Higher Btu Gases has scheduled its discussion topics as follows: Safety in High Btu Operation; Reconstruction of Existing Plant to High Btu Plant; Checker

Brick; Results from Different Types of Plant-Unit Figures, Cycles and Temperatures; Oils Available and Method of Introduction; Scrubbing and Residuals; Gas Analyses, Flame Characteristics and Interchangeability; Present Research of A. G. A. and I.G.T. Gordon G. Howie, Cambridge (Mass.) Gas Light Co., will be luncheon chairman, and H. E. Ferris, South Atlantic Gas Co., Savannah, alter-

nate chairman. The subcommittee has appointed W. H. Isaacs, The Peoples Gas Light & Coke Co., as safety representative to promote safety in high Btu operation and work with the A. G. A. Accident Prevention Committee.

Subcommittee on the Use of Oxygen in Gas Manufacture will also meet at luncheon on Tuesday. Howard R. Batchelder, U. S. Bureau of Mines, Louisiana, Mo., luncheon chairman, has outlined the following agenda: "Oxygen or Air in Gas Production?" by Samuel Strelzoff, Chemical Construction Corp.; "Present Views on Economics of Oxygen Usage," L. W. Alberts, Chemical Plants Division, Blaw-Knox Co.; Progress and Program of Pittsburgh Consolidation Coal Co.; Progress Report on Oxygen Plant and Oxygen Costs. A discussion from the floor concerning use of oxygen in gas manufacture will complete the luncheon conference. Professor R. R. White, University of Michigan, Ann Arbor, will be alternate chairman.

Subcommittee on Plant Waste Disposal, with Chairman F. E. Vandaveer, The East Ohio Gas Co., presiding, is the third luncheon group scheduled for Tuesday. K. E. Baird, Philadelphia Coke Co., and Dr. W. W. Hodge, Mellon Institute of Industrial Research, Pittsburgh will discuss "Phenols." "Inorganic Materials—Cyanides, Sulfides, Thio-Compounds," will be the topic of J. E. Brewer, Brewer and Gardner, Philadelphia; S. A. Petrino, Kings County Lighting Co., Brooklyn, will follow with a discussion of "Oily Wastes—Dispersion." J. J. Gilbert will then speak on "Suspended Solids." An examination of Safety in Plant Waste Disposal will complete the luncheon conference.

A special symposium on reforming natural gas will be the main feature of the Wednesday morning general session. L. E. Osmer, The Girdler Corp., Louisville, Ky., and chairman, A. G. A. Builders' Subcommittee, will open the session at 9:30 with the report of his group. C. S. Spencer, Michigan Consolidated Gas Co., will follow with "Field Testing of LP Materials Received."

The symposium is scheduled for the greater part of the morning session. Topics include: "Catalytic Furnace Cracking," by S. W. Horsfield, Long Island Lighting Co., Garden City; "Cyclic Catalytic Cracking," O. B. Holman, The Philadelphia Gas Works Co.; "Utilization of (Continued on page 36)

A. G. A. approves new appliance standards

Important new gas appliance approval requirements and significant revisions of existing standards and test methods have been adopted by American Gas Association Approval Requirements Committee. Composed of representatives of utilities, manufacturers, public bodies and trade associations, the committee met at the A. G. A. Laboratories on March 6, 1951.

The committee reviewed and adopted the recommendations of a number of its subcommittees that have extensively modified individual requirement texts to meet new trends and industry needs as disclosed by research, technical investigations and field experience throughout the country. The new standards now go to American Standards Association for final adoption. Upon acceptance, they will become effective in 1952.

Major revisions adopted will affect the testing of central heating equipment, unit heaters, water heaters and automatic pilots. Of special importance was the adoption of new test methods covering electrical components on appliances and expansion of existing provisions for such features.

Central heating revisions cover the many changes in design that have accompanied the trend to compact, automatically controlled equipment, in many in-

stances requiring advanced electrical and mechanical components. Devoted mainly to boilers and furnaces, they contain sections covering such units designed for confined space installation. They also include up-to-date revisions applying to recessed heaters.

The new central heating text will be published in four separate volumes, replacing the present 128-page issue with two addenda. These will be: Volume I, "Steam and Hot Water Boilers"; Volume II, "Gravity and Forced Air Furnaces"; Volume III, "Gravity and Fan Type Floor Furnaces", and Volume IV, "Gravity and Fan Type Recessed Heaters". The arrangement is designed to simplify and expedite use by placing together all provisions relating to a specific appliance.

Requirements for unit heaters were also revised extensively and a complete new text adopted. Differentiation was established between low static pressure and high static pressure units. The former as a rule employ propeller type fans while the latter utilize blowers. By definition, low static pressure units may employ face extensions while high static pressure units may be equipped with duct work. The allowable temperatures produced by unit heaters on surrounding combustible structures were coordinated carefully

with the requirements of other testing organizations. Further revisions are under way which will develop requirements for units of very high input rating, these frequently incorporating special design features. They are expected to be ready next year.

Electrical requirements for central heating appliances, unit heaters and ranges likewise were coordinated with those of other testing organizations. Major provisions are standards for the temperatures at which electrical components operate, a dielectric test and a current leakage test. In order that greater acceptance of appliances by electrical code authorities may be obtained, the Laboratories have obtained and are using new electrical testing facilities and will formulate test methods covering all types of appliances. The committee authorized the Laboratories to start applying such tests since present construction requirements call for adequate wiring and proper electrical controls.

Listing requirements for automatic pilots were completely rewritten to provide for their testing under conditions more nearly approaching those encountered in the field. Use of a test burner that the pilot is required to light was adopted and a new type of (Continued on page 48)



Representatives of utilities, manufacturers, public bodies and trade associations on the A.G.A. Approval Requirements Committee meeting at the American Gas Association Laboratories on March 6, 1951. Clarence H. Waring (head of table), Kansas City, Kan., is currently chairman of the committee

Industry news

Gas men named to defense advisory posts

RECENT top level appointments by U.S. Secretary of Interior Chapman have paved the way for the gas industry to place its full resources behind the national mobilization program.

On March 12 Mr. Chapman appointed C. P. Rather, president, Southern Natural Gas Corp., Birmingham, Ala., as Assistant Deputy Administrator of the Petroleum Administration for Defense, in charge of matters involving transmission and distribution of gas. One of Mr. Rather's principal tasks will be to assist Deputy Petroleum Administrator Bruce K. Brown in developing the mobilization program as it affects the gas industry.

At the same time, Mr. Chapman announced the resignation of two gas industry executives who had been serving on a temporary basis pending the appointment of permanent staff members. R. H. Hargrove, president, Texas Eastern Transmission Corp., Shreveport, La., resigned as Acting Assistant Deputy Administrator of the Petroleum Administration for Defense (PAD). N. W. Freeman, vice-president, Tennessee Gas Transmission Corp., Houston, Texas, resigned from his temporary post as Acting Director, Gas Division of PAD.

Sixty-one natural gas and manufactured gas industry executives were appointed by Mr. Chapman to serve on a newly established Gas Industry Advisory Council. This group will supply advice and counsel regarding the Secretary's discharge of defense responsibilities with respect to gas. The Department of Interior was made claimant agent for the gas industry under Defense Production Act of 1950.

The following executives have been appointed to the new Gas Industry Advisory Council:

E. R. Acker, president and general manager, Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y.; B. C. Adams, president and general manager, The Gas Service Co., Kansas City, Mo.; Thomas H. Allen, president, Memphis Light, Gas and Water Division, Memphis, Tenn.; L. L. Baxter, president, Arkansas Western Gas Co., Fayetteville, Ark.; Walter C. Beckjord, president, The Cincinnati Gas & Electric Co., Cincinnati, Ohio; Eskil I. Bjork, vice-president, The Peoples Gas Light & Coke Co., Chicago, Ill.; James B. Black, president, Pacific Gas & Electric Co., San Francisco, Calif.; George H. Blake, president, Public Service Electric & Gas Co., Newark, N. J.

Also Everett J. Boothby, president, Washington Gas Light Co., Washington, D. C.; Joseph Bowes, president, Oklahoma Natural Gas Co., Tulsa, Okla.; A. F. Bridge, president and general manager, Southern Counties Gas Co., Los Angeles, Calif.; Walter S. Byrne, general manager, Metropolitan Utilities District, Omaha, Neb.; A. W. Conover, president, Equitable Gas Co., Pittsburgh, Pa.; Charles P. Crane, president, Consolidated Gas Electric Light and Power Co. of Baltimore, Baltimore, Md.; Stuart M. Crocker, president, The Columbia Gas System, Inc., New York, N. Y.; Hugh H. Cuthrell, vice-president, The Brooklyn Union Gas Co., Brooklyn, N. Y.; E. H. Eacker, president, Boston Consolidated Gas Co., Boston, Mass.; Edward Falck, Edward Falck & Co., Washington, D. C.; John A. Ferguson, executive director, Independent Natural Gas Association of America, Washington, D. C.; Henry Fink, president, American Natural Gas Co., New York, N. Y.; R. Leslie Fletcher, president, Providence Gas Co., Providence, Rhode Island.

Also H. C. Forbes, executive vice-president, Consolidated Edison Co. of New York, Inc., New York, N. Y.; N. Henry Gellert, president, Seattle Gas Co., Seattle, Wash.; C. H. Gueffroy, president, Portland Gas & Coke Co., Portland, Ore.; George S. Hawley, president, The Bridgeport Gas Light Co., Bridgeport, Conn.; Joseph J. Hedrick, president, Texas Illinois Natural Gas Pipe Line Co., Chicago, Ill.; Robert W. Hendee, president, Colorado Interstate Gas Co., Colorado Springs, Colo.; Norman Hirschfield, president, Consolidated Gas Utilities Corp., Oklahoma City, Okla.; D. A. Hulcy, president, Lone Star Gas Co., Dallas, Texas; S. B. Irelan, president, Cities Service Gas Co., Oklahoma City, Okla.; Paul Kayser, president, El Paso Natural Gas Co., El Paso, Texas.

Also Thomas L. Kemp, general manager,

Citizens Gas and Coke Utility, Indianapolis, Ind.; W. L. Kendrick, South Boston, Mass.; W. H. Ligon, president, Nashville Gas and Heating Co., Nashville, Tenn.; J. E. Loiseau, president and general manager, Public Service Co. of Colorado, Denver, Colo.; E. E. Lundgren, vice-president, Public Service Co. of Northern Illinois, Chicago, Ill.; Alexander Macomber, president, Gas Service, Inc., Boston, Mass.; William G. Maguire, chairman of the board, Panhandle Eastern Pipe Line Co., New York, N. Y.; W. G. Marbury, president and manager, Mississippi River Fuel Corp., St. Louis, Mo.; H. L. Masser, executive vice-president, Southern California Gas Co., Los Angeles, Calif.; D. A. McGee, executive vice-president, Kerr-McGee Oil Industries, Inc., Oklahoma City, Okla.; N. C. McGowan, president, United Gas Corp., Shreveport, La.; J. F. Merriam, president, Northern Natural Gas Co., Omaha, Nebraska.

Also the following: Dean H. Mitchell, president, Northern Indiana Public Service Co., Hammond, Ind.; George T. Naff, executive vice-president, Texas Eastern Transmission Corp., Shreveport, La.; W. C. Norman, president, Northeastern Gas Transmission Co., Springfield, Mass.; Hudson W. Reed, president, The Philadelphia Gas Works Co., Philadelphia, Pa.; James C. Reid, vice-president, Southern Union Gas Co., Dallas, Texas; J. French Robinson, president, The East Ohio Gas Co., Cleveland, Ohio; Cecil W. Smith, vice-president and chief engineer, Montana-Dakota Utilities Co., Minneapolis, Minn.; A. H. Stack, president and manager, The Tampa Gas Co., Tampa, Fla.; C. M. Stephens, president and general manager, Council Bluffs Gas Co., Council Bluffs, Iowa.

Also W. T. Stevenson, executive vice-president and treasurer, Texas Gas Transmission Corp., Owensboro, Ky.; Gardiner Symonds, president, Tennessee Gas Transmission Co., Houston, Texas; R. G. Taber, president, Atlanta Gas Light Co., Atlanta, Ga.; Wade V. Thompson, president, East Tennessee Natural Gas Co., Nashville, Tenn.; John H. Ware, 3rd, chairman of the board, Pittston Gas Co., Pittston, Pa.; A. H. Weyland, president and general manager, Arkansas Louisiana Gas Co., Shreveport, La.; Claude A. Williams, president, Transcontinental Gas Pipe Line Corp., Houston, Texas; H. Carl Wolf, managing director, American Gas Association, and H. K. Wrench, president, Minneapolis Gas Co., Minneapolis, Minnesota.

Gas & electricity costs below prewar average

GAS AND ELECTRICITY COSTS have not contributed to rising costs of living. From August 1941 through August 1950 the index of the total cost of living as computed by U. S. Bureau of Labor rose from 106.2 percent to 173.0 percent of the 1935-39 average. Despite the over-all rise, in August 1941 the Bureau's index of the cost of gas and electricity stood at 97.1 percent of the 1935-39 average and in August 1950 it stood at 97.0 percent.

In maintaining this stability of cost over the ten-year period, the cost of utilities ran contrary to the trend of all other components in the Bureau's list for analysis in arriving at

its Cost of Living Index. Food costs in August 1941 stood at 108.0 percent of the 1935-39 average, and in August 1950 had risen to 209.0 percent. Clothing costs rose from 106.9 percent to 185.9 percent during the ten-year period.

Rents, despite controls invoked during the war years and still in limited effect, climbed from 106.3 percent to 124.8 percent in the past ten years. Prices of home furnishings rose substantially, climbing from 108.9 percent in 1941 to 189.3 percent of the base average in August 1950. Costs of miscellaneous items used in the index rose from 104.0 percent to 156.1 percent.

The cost of gas and electricity moved up in the ten-year period only twice, according to U. S. Bureau of Labor statistics. In December 1949 and again in April 1950, the cost index of these utility services stood at 97.2 percent or one-tenth of one percent above the 1935-39 average. The index reached its lowest point in August 1946 when costs of gas and electricity had declined to 91.8 percent of their 1935-39 average. In the same month the cost of living index stood at 144.1 percent; food costs were 171.2 percent; clothing costs stood at 161.2 percent and house furnishings were costing 160 percent of the 1935-39 average.

Natural gas meeting to analyze defense picture

THE gas industry's position in the national mobilization picture will be analyzed from many angles during the 1951 spring meeting of the Association's Natural Gas Department. Sessions for this annual event, one of the most important on the gas industry calendar, will be held May 7 and 8 in Dallas, Texas, with headquarters at the Baker Hotel.

Leading gas industry and guest authorities will address the two morning General sessions. C. E. Bennett, chairman of the Natural Gas Department and vice-president, American Gas Association, will preside.

Some 900 or more natural gas men are expected to be present when President D. A. Hulcy of A. G. A. discusses the industry's progress and plans for the future. Another top priority subject, prospects for obtaining steel to meet the gas industry's requirements, will be covered by a representative of one of the country's leading steel companies.

Also scheduled for the opening general session is a report on the Natural Gas Department's research program under the PAR Plan. E. F. Schmidt, chairman, A. G. A. Technical and Research Committee, and vice-president, Lone Star Gas Co., Dallas, will be the speaker.

Closing event of this session will be a discussion on the possibility of a national fuel program by a prominent leader of the industry.

Features of the second general session will include a discussion of industry regulation and legislation from management's viewpoint. In addition, a government official will discuss defense and mobilization activities as they affect the gas industry.

Both afternoons will be devoted to open sessions of the Transmission Committee, at which operating men will review progress in that field. Scheduled papers will cover gas turbines as prime movers for compressor stations, pulsation, pipeline right-of-way maintenance, and modern communications as used by pipeline companies.

Two of the most recent motion pictures sponsored by gas companies will be shown during the two-day sessions.

Committee meetings also have been scheduled for both days by the Natural Gas Managing and Advisory Committees, Technical and Research Committee, Transmission Committee, and Pipeline Flow Subcommittee.

Entertainment for the ladies will include a style show and bridge party. Last year's pre-registration system proved so successful that it



C. E. Bennett



E. F. Schmidt

will be used for the 1951 meeting. This will enable delegates to register in advance rather than at the meeting, thus saving considerable time and trouble. Natural gas men should apply direct to the Baker or Adolphus Hotels.

Details of the meeting are being completed by the Program Committee headed by Chairman E. F. Schmidt, vice-president, Lone Star Gas Company. Other members are A. F. Bridge, president and general manager, Southern Counties Gas Co., Los Angeles, Calif.; E. P. Noppel, vice-president, Ebasco Services Inc., New York, and R. W. Hendee, president, Colorado Interstate Gas Co., Colorado Springs.

Gas industry represented at fuel policy hearing

THE American public should be allowed to continue its free choice of fuels in an open competitive market. This was one of the major points argued by Paul Kayser, president, Independent Natural Gas Association of America, during a round-table discussion of the nation's energy resources, March 7-9.

Mr. Kayser was one of 13 experts from the private gas, coal and oil industries called to

Washington to present their views before a Senate committee regarding possible formation of a "national fuels policy." Max Ball, oil and gas consultant, was another member of the panel. Also present was George H. Smith, assistant managing director, American Gas Association.

Mr. Kayser contended that from the long-range point of view, the present fuel policy which has produced the highest standard of

living in the world, should not be changed. He noted that despite a phenomenal growth of the natural gas industry, proved recoverable reserves of gas are still on the upgrade. The gas industry is developing a highly efficient nationwide transportation system for its fuel, he said. Mr. Kayser also indicated interest in further development of synthetic liquid fuels and recommended continued research.

Gas exhibit stars at Philadelphia show

THE Philadelphia Gas Works Company and Pennsylvania Gas Association joined forces during the week of February 12 to create one of the outstanding exhibits of the Eastern Regional Restaurant Convention and Exposition. Over 5,000 commercial gas men from Pennsylvania and New Jersey visited the exhibit at the Bellevue-Stratford Hotel in Philadelphia.

Motif of the 42-foot gas exhibit, in which nine manufacturers participated, was "You can depend on the jet." Flanking a large blue flame were two panels, one stating "99 percent of all commercial ranges used to prepare food in Philadelphia are operated by gas," and the other, "Sanitize your china and silverware with 180-degree water provided automatically by gas water heaters." A jet airplane symbolized the speed of gas cooking.

Dealers, suppliers and commercial men from the local gas company were in constant attendance to meet visitors and describe new appliance features. Cooperating exhibitors were: The G. S. Blodgett Co., showing their new baker's stove; Cleveland Range Co., vegetable steamers; MagiKitch'n Corp., Frymaster counter appliances; Market Forge Co., vegetable steamers; Martin Specialty Oven Co., deck ovens; J. C. Pitman Sales Corp., deep fat fryers; Savory Equipment, Inc., toasters; A. O.

Smith Corp., two-temperature water heaters, and Aeroil Products Co., Inc., new counter Griddle-Toaster-Broiler.

Important meetings were held during the week covering various phases of the restaurant business. A formal luncheon was addressed by Elston L. Ireland, president of the National Restaurant Association. In his address he said:

"All of us who have been in the restaurant business for any length of time realize, that

... we must find ways for machines to do many things we are now doing either by hand or by crude machinery. Our opportunity to feed people food properly cooked, perfectly balanced from a nutrition standpoint and beautiful in appearance has never been greater."

This suggests there is a market for modern commercial cooking equipment embodying temperature control on ovens and griddle tops together with ceramic radiants in the broilers.



Combined exhibit of Pennsylvania Gas Association and The Philadelphia Gas Works Company at Eastern Regional Restaurant Convention and Exposition. Motif of gas display was "You can depend on the jet"

Southern Union unveils remodeled offices

SOME 1,800 people attended the formal opening of Southern Union Gas Company's newly remodeled office building in El Paso, Texas, on January 29, 1951. Visitors were taken on conducted tours of the gas company's new home and its display of the latest modern gas appliances. Refreshments and souvenirs were passed out by employees.

Also greeting the visitors were El Paso District Manager E. M. Kelley and officials of the company. These included President C. H. Zachry and Vice-President J. R. Cole, III.

The \$130,000 remodeling and modernization project was started in April 1950 as a part of Southern Union's over-all \$7 million improvement and expansion program during 1950. A like amount has been allocated for expansion and improvement in 1951 throughout the company's system in Texas, New Mexico and Colorado. Nearing completion now are a newly constructed building in Albuquerque, N. M., and a remodeled building at Pecos, Texas.

The El Paso building, a two-story structure with a basement and mezzanine floor, has exterior walls of gray terra cotta blocks and plate glass. Ceiling-to-floor plate glass windows form all but one wall of the first floor.

Most outstanding features of the building are a large auditorium or hospitality room on the second floor and a special display room in the basement. The latter is for use in displaying heavy-duty gas equipment and items otherwise not shown on main sales display floor.

The enlarged hospitality room is equipped with a modern display stage, which has kitchen cabinets of steel, an automatic gas range and a gas refrigerator. An adjacent kitchen has facilities for cooking for as many as 200 people at one time. By use of folding doors, the hospitality room can be divided into two separate rooms.

The gas industry's symbol, the blue flame, has been built into the floor of the main display room, immediately in front of the first floor entrance.

Direct and indirect lighting and streamlined built-in counter facilities for customer service are featured on the first floor. The building is heated and cooled by all-year gas air conditioning equipment.

McCall's opens test suite

SOME nine of the newest, most modern and most functional kitchens and appliance test rooms in the country have been opened in New York City by *McCall's Magazine*. Every recipe that appears in the magazine is tested in the four food kitchens, one of which is all-gas. Tests are under the supervision of Helen McCully, food editor.

Latest models of gas and electric household appliances, detergents, fabrics, and up-to-date kitchen and laundry tools, are tested in the appliance kitchens and test rooms. This work is supervised by Mrs. Elizabeth Sweeney Herbert, household equipment editor, and her staff. Products of 280 national manufacturers are represented in the test rooms. Confidential reports are submitted to the manufacturers on the various tests.

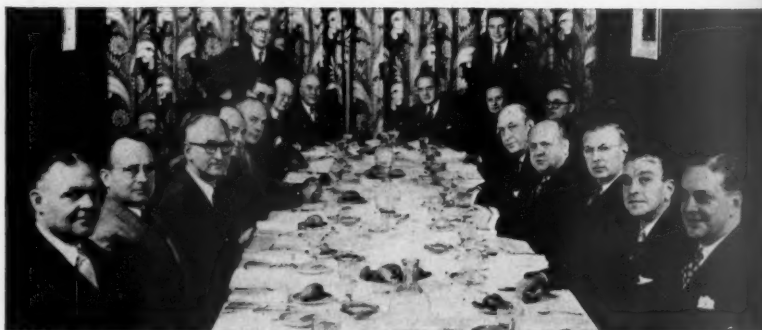


Night exterior view of Southern Union Gas Company's recently remodeled office building in El Paso, Texas. Some 1,800 people attended the formal opening on January 29. Major features of the two-story building are a large auditorium or hospitality room and a special display room in the basement.



Officials of Southern Union who participated in opening of remodeled office building: (Left to right) C. H. Zachry, president; E. M. Kelley, district manager at El Paso, and J. R. Cole, III, vice-president.

A.G.A. advertising group meets



A.G.A. National Advertising Committee in New York on March 16: (Seated, left to right) H. V. Potter, A.G.A.; Carl H. Horne, Birmingham, Ala.; W. M. Jacobs, Los Angeles; Dean A. Strickland, Houston; R. G. Barnett, Portland, Ore.; Leon Ourusoff, Washington, D. C.; J. P. Leinroth, Newark, N. J.; J. J. Quinn, Boston; Christy Payne, Jr., chairman; C. W. Person, A.G.A.; R. W. Fenton, Chicago; Chester L. May, Dallas; Fred W. Dopke, Indianapolis; Jesse L. Johnson, Providence; J. W. West, Jr., A.G.A.; Irving K. Peck, Pittsburgh; (standing in the rear) Michael E. Shea, Lynchburg; W. B. Hewson, Brooklyn.

Ebasco completes utility safety seminar

TWENTY utility company representatives from United States and Latin American companies attended the fourth annual seminar in public utility safety completed March 2 in New York. Conducted jointly by Ebasco Services Inc. and New York University, the seminar was the fourth of the series arranged by the two institutions.

William T. Rogers, Ebasco safety consultant, acted as director of the seminar. He noted that although the series was planned as a course for safety directors, the most recent one turned out to be a training course for supervisory and executive personnel. This is exactly as it should be, he declared, "because safety is definitely the responsibility of the line operating organization."

One of the key factors in any safety program, Mr. Rogers said, is the attitude of the chief executive.

Conferees were told that a good way to "sell" management the need for a safety program is to show the high cost of accidents. Accidents cost the people of the United States

some \$7,100,000,000 a year, the men learned. They were told about a recent survey of a group of 15 gas, electric and combination gas and electric companies in this country for the purpose of determining their accident costs and the cost of safety work. The companies represent over 76,000 employees with a total annual payroll of \$237 million. Actual figures show an annual compensation cost, exclusive of insurance premiums, of \$592,294, a medical cost of \$254,000, and direct payments of \$244,000 for a total out-of-pocket accident cost of \$1,090,963. This amounted to approximately \$0.46 per \$100 of payroll. On a case basis this figure amounted to about \$430 per lost-time accident case.

"Safety takes on added importance today, when we are faced with the accelerated mobilization of manpower for defense," Mr. Rogers said. "As this mobilization gets into full swing the country will be hard pressed to furnish enough manpower for the armed services, for the war industries and to keep the domestic economy going. The manhours lost as a result

of accidents in industry would provide the equivalent of 706,000 workers."

The responsibility for safety is threefold, Mr. Rogers declared. "It rests on management, on supervisors and on employees." The management of the company, however, is primarily responsible, he said. They are responsible to the public, to their employees and to their stockholders for setting up and maintaining a successful safety program.

Several field trips were arranged for the men attending the seminar. They inspected the training school of Long Island Lighting Company and also visited Consolidated Edison Co. of New York, Inc., and reviewed their safety program.

At Fort Jay, Governor's Island, conferees spent an afternoon learning about the First Army's safety program, which has cut down the automotive accident rate from 14 accidents per 100,000 miles traveled to two per 100,000 miles.

Upon completion of the two-week seminar, those attending were awarded diplomas.

Southern California's industrial gas load rising

SOME interesting trends have been noted by Southern California Gas Company regarding the effect of defense work on the industrial gas load (see "Gas spurs defense effort," A. G. A. MONTHLY, March 1951, pp. 2-5).

According to R. B. Grossman, manager of commercial and industrial sales, gas usage by industrial plants has been increasing rapidly in the last few months. A general expansion of existing defense plants is under way, rather than an extensive increase in the number of

new plants. In addition, existing plants are buying new and better equipment. All manufacturers of gas equipment in the area are quoting and selling additional gas equipment at a faster rate than they have for some time.

Specific instances of large increases in the gas load were mentioned by Mr. Emmons. Manufacture of synthetic rubber has been resumed in the area with the reopening of the Shell Chemical plant and expansion of operation by Dow Chemical Company and Standard Oil Company. The polymerization plant op-

eration has been turned over to Minnesota Mining and Manufacturing Company.

In addition, Norris Stamping Company is changing from bath tubs to shell casings, an activity they undertook during the last war. The petroleum industry again is operating under peak conditions. The aircraft industry is expanding and probably will increase further in the next few months. Numerous other industries are expanding or changing operations in a similar manner.

Monthly reprints available

REPRINTS of articles appearing in this issue of the MONTHLY are available at cost in quantities of 100 or more. Orders should be addressed to Editor, A. G. A. MONTHLY, American Gas Association, 420 Lexington Ave., New York 17, N. Y. All orders must be in the editor's hands on or before May 1. A limited supply of copies of the April issue is available at 30 cents each.

Greetings, Transgas!

NEWEST addition to the gas publication family is *Transgas*, published monthly by Transcontinental Gas Pipe Line Corp., Houston, Texas. Ken B. Harper is editor.

The youngster's birth was marked by an attractive 38-page March issue covering highlights of the turn-on ceremony for Transcontinental's 1,840 Texas-New York natural gas line. In a special message to readers, Claude A. Williams, Transcontinental president, outlined the company's growth and plans for future expansion. Large illustrations, clean typography and careful use of color make the publication extremely readable.

Well done, *Transgas*! Continue to keep us posted!

Western-Holly wins color & design "Oscar"



Henry Honer (center), president, Western-Holly Appliance Co., receiving first "Oscar" ever given to any product by Academy of Color and Design. Basis for the award was the streamlined design and unusual pastel colored top of Western-Holly gas ranges. Picture shows (left to right) David Shulgold, editor, Architectural Products; J. Shelley Thedford, chief decorator, W. & J. Sloane, Beverly Hills; Mr. Honer, Actress Adele Mara, and Lou Gould, nationally-known industrial designer

United, Texas Eastern, Algonquin plan expansions

MAJOR EXPANSION programs of United Gas Pipe Line Co., Texas Eastern Transmission Corp., and Algonquin Gas Transmission Co., have been approved by Federal Power Commission. The first two companies are located in Shreveport, La., and the third in Boston, Massachusetts.

United plans to increase its system capacity by 920 million cubic feet a day to an estimated 3,805,200,000 cubic feet. One of the largest expansion programs ever to receive FPC approval, the project includes construction of approximately 1,000 miles of pipeline and installation of 63,000 horsepower at new and existing compressor stations. Estimated cost is \$111,861,749.

United will make new sales of gas as follows: to Texas Eastern, 390,250,000 cubic feet on a peak day and 135,124,260,000 cubic feet annually; to Mississippi River Fuel Corp., St. Louis, Mo., 150 million cubic feet on a peak day and 52,448,885,000 cubic feet annually.

The Texas Eastern project is expected to cost \$96,305,118. It includes approximately 791 miles of 30-inch line from a connection with United's system in Mississippi to a connection with Texas Eastern's existing system in Pennsylvania. Some 13 compressor stations will be built with an aggregate of 96,400 installed horsepower.

Part of Texas Eastern's increased capacity

will go to Algonquin for resale to various utilities in the New England states at Massachusetts, Rhode Island and Connecticut. The remainder will be delivered to new and existing customers.

Algonquin was authorized to construct approximately 253 miles of main line and 279.2 miles of laterals in New England. Total estimated cost of the pipeline system, which will deliver a total maximum daily volume of 217,800,000 cubic feet a day is \$30,477,800.

United's project will consist of two major pipelines. The west line will be about 510 miles long and of 30, 26 and 24-inch pipe. It will extend from southern Texas to a point in Louisiana. Compression facilities aggregating 42,200 horsepower will be installed on this line.

The east line will consist of approximately 305 miles of 30, 26, 24 and 20-inch pipe. It will extend from off-shore acreage in the Eugene Island area of the Gulf of Mexico to a point in Mississippi, with 20,800 horsepower of compression. Three supply and delivery lines, totaling about 179 miles in length, will extend from southern and southeastern Louisiana and Mississippi gas fields to various points of connection with the east line.

Maine utility sponsors gas cooking messages

For you -- the real thing

Today's Gas range is the most up-to-date cooking appliance you can own. Even competing fuels accept Gas as the standard. In top cooking, oven, and broiler they seek to match the qualities only the clean blue Gas flame can give . . . the speed, the range of heats, the thrifty adjustability of Gas to any size utensil . . . the even heat distribution, the precisely controlled low temperatures you get only in a Gas oven . . . the charcoal flavor of flame-broiled meats. Today, as always, Gas sets the standard. Your modern Gas range is no imitation — it's the real thing.

Gas Cooking...
Best Then
Best Now
Best Tomorrow

PORTLAND GAS
LIGHT CO.

One of a current series of local newspaper advertisements sponsored by Portland (Me.) Gas Light Company with straight "fact copy" about gas cooking and preference for gas. Trend in these messages is to recipes that are most easily prepared on gas-fired equipment. Numerous comments have been received by the utility and its home service department about the helpful nature of the copy

A.G.A. Washington office

AERICAN GAS ASSOCIATION intends to open an office in Washington, D. C., about April 1 to assist members on questions concerning the defense program and relations between industry and government.

George H. Smith, assistant managing director of A. G. A., will be in charge of the new Washington office. Mr. Smith is currently serving as secretary of the Association's National Defense Committee. He will continue to direct from New York activities of the A. G. A. Natural Gas Department, of which he is secretary.

What to read

- **The Big-Inchers** (*Fortune*, January 1951)—An illustrated feature article telling the dramatic story of pipeline builders who laid 20,000 miles of welded arteries beneath U. S. soil last year (*Fortune Magazine*, 9 Rockefeller Plaza, New York).
- **Dorcie Calhoun Struck It Rich** (*Collier's*, January 13, 1951)—The story of a farmer who insisted that he'd find natural gas on his Pennsylvania farm; how he resisted ridicule but finally hit the jackpot (*The National Weekly Collier's*, 640 Fifth Ave., New York).
- **Texas, First in Natural Gas** (*The Second National Bank*, Houston)—Basic facts about the Texas natural gas industry, drawn from official sources and presented for the benefit of a noted financial institution's customers and friends. In booklet form (*The Second National Bank*, Houston, Texas).
- **Dorsey Hager's Practical Oil Geology**, revised to include all recent advances and developments in petroleum geology and engineering (*McGraw-Hill Book Information Service*, 327 W. 41 St., New York 18, N.Y.).

Minneapolis holding '51 Kitchen Cavalcade

MINNEAPOLIS GAS COMPANY is now conducting its colorful 1951 Kitchen Cavalcade. A brand new series of modern gas kitchen and laundry displays is being exhibited daily in the windows and on the main floor of the company. Nearly 100 dealers (of kitchen cabinets and gas appliances) and distributors are cooperating in the educational program, largest of its kind in the country.

The 1951 Kitchen Cavalcade is patterned after Minneapolis' 1950 show which proved a resounding success. Visitors to the new show will see six outstanding examples of New Freedom Gas Kitchen design and operation, plus the latest developments in the automatic home appliance and equipment field. Each kitchen will be completely redecorated and equipped every three months with the entire Cavalcade continuing throughout 1951. Some 160,000 bill insertions and local newspaper advertisements are being used by the gas company to draw the public's attention to the show.

Special engraved invitations are being sent to architects, contractors, home economics teachers, PTA presidents, and other groups. Over 1,000 employees of the gas company will receive instructions to acquaint them with the project.

According to E. J. Boyer, sales manager, Minneapolis Gas Co., from six to 15 employees will be on the scene constantly to give expert advice to prospective customers. The sales, home service and kitchen planning departments all will be represented. Robert Calrow is kitchen planning director for the gas company.

A series of live demonstrations also is planned. In addition, special emphasis will be placed on laundry room equipment in several of the gas equipment displays.

Advertising

If you cut down on advertising in these challenging times, you may have the most economically operated empty store in town—Joseph B. Elliott, RCA-Victor.

A. G. A. announces March '51 publications

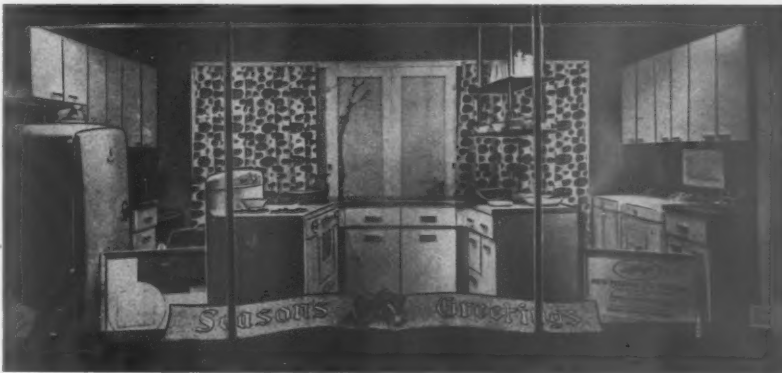
LISTED BELOW are publications released by American Gas Association during March 1951 up to the time the MONTHLY went to press. Information shown in parentheses indicates the audience for which each publication was designed.

Residential

• **Window and Store Display Bulletin** (for gas company display men). Prepared by A. G. A. Window & Store Display Committee. Available from A. G. A. headquarters without charge.

Statistical

• **Natural Gas & Natural Gas Liquids Reserves Estimates**, December 31, 1950 (for gas companies, oil companies, investment and brokerage houses, government groups). Sponsored by A. G. A. Committee on Natural Gas Reserves and available from A. G. A. Bureau of Statistics without charge.



"Hub of the House" kitchen, one of a new series of New Freedom Gas Kitchens and Laundries in the 1951 Kitchen Cavalcade on the main floor of Minneapolis Gas Company. Four modern window displays and two interior kitchens are presented by nearly 100 dealers of kitchen cabinets and gas appliances and distributors in cooperation with the gas company. Cavalcade will continue throughout 1951



One of the New Freedom Gas Kitchen and Laundry displays that is attracting attention among visitors to the Minneapolis Kitchen Cavalcade. In addition to showing a new concept of kitchen and laundry planning, this exhibit is a "live" display with all equipment fully installed and operated

• **Quarterly Report of Gas Utility Sales—Fourth Quarter 1950** (for gas companies, security analysis, regulatory groups, college libraries). Available from A. G. A. Bureau of Statistics without charge.

• **Monthly Report of Gas Sales—January 1951** (same audience as above). Available from A. G. A. Bureau of Statistics without charge.

Promotion

• **Tick-Tock Clock-Controlled Oven Meals for Your Modern Automatic Gas Ranges**; available from A. G. A. Promotion Bureau at 15 cents a copy. PAR.

• **Three new booklets in the Big Ten Series** as follows: **10 Key Pieces to Modern Kitchen Planning**; **You'll Be in Clover 10 Times Over with a New Automatic Clothes Dryer**; **10 Predictions for Fair & Warmer When You Heat Your House with Gas**; all avail-

able from A. G. A. Promotion Bureau. Prices are 4½ cents a booklet for 100 to 999 copies of the same booklet; 4¼ cents each for 1,000 to 9,999 copies, and four cents each in quantities of 10,000 or more. Subscribers to the PAR Plan are allowed discount of 1½ cents a booklet. PAR.

• **Spring Festival Portfolio**; available from A. G. A. Promotion Bureau at 25 cents each. PAR.

Research

• **Research Bulletin 62, A Study of Fundamentals of Design of Non-Primary Aerated Blue Flame Gas Burners**, Project DGR-14-GU (for gas companies, appliance and equipment firms, and selected lists); sponsored by A. G. A. Committee on Domestic Gas Research. Available from A. G. A. Laboratories, \$1.50 a copy. PAR.

Ruthenburg cited by Freedoms Foundation

LOUIS RUTHENBURG, chairman of the board, Servel, Inc., Evansville, Ind., was honored recently by Freedoms Foundation for his "significant work in building a better understanding of the American way of life."

Cited at the annual ceremony at Valley Forge, Pa., Mr. Ruthenburg won an award in the public address division for his talk "Birthright of Freedom" delivered last July before the Indiana University Workshop on Economic Education. First place in the public ad-

dress category went to General Dwight D. Eisenhower. Other winners were Herbert Hoover and Captain Eddie Rickenbacker.

Bishop Publishing Co., Chicago, which last year won top recognition for a series of "Freedom Posters" widely used by utility and manufacturing concerns, was cited this year as a second-place winner in the general category.

Relief Valve, Grayson Controls Division, Robertshaw-Fulton Controls Co., was awarded first place in the employee publications cate-

gory. Joe McMillan, Lynwood, Calif., is editor of the magazine.

General of the Army Omar Bradley presented the awards. The Foundation is a non-profit, non-political and non-sectarian organization chartered in 1949 to recognize Americans who are doing outstanding work in interpreting the American ideal of freedom. It awarded \$100,000 this year to more than 800 individuals and organizations in 19 categories.

New England system preparing for natural gas

WITH natural gas expected in New England this fall, every gas appliance on the lines of 16 member gas companies in the New England Electric System will have to be converted. Conversions & Surveys, Inc., a subsidiary of Stone & Webster, has been hired to do the job.

Methods and procedures of the planned operation were explained to system gas officials and public relations men earlier this year during special meetings. Herbert C. Jones, gas engineer, New England Power Service Co., arranged the sessions.

Present schedule calls for advent of natural gas via Northeastern Gas Transmission Company pipeline sometime in 1951. To control and tie in the complete conversion, a system coordinator will be appointed and local coordinators for the 19 major cities which must be changed over to use of natural gas.

Booklet offers new automatic cookery data

a PAR activity

A BRAND NEW 32-page cookbook devoted exclusively to menus

for clock controlled gas ranges is now available to the industry. "Tick-Tock Clock—Controlled Oven Meals for Your Modern Automatic Gas Ranges" was sponsored by the Home Service Committee of American Gas Association. Material was prepared by the Home Service Committee of Pacific Coast Gas Association, Maxine Howe, Southern California Gas Co., chairman.

Financed by the A. G. A. PAR Plan, the new booklet is ideally suited for use in the promotion of fully automatic gas ranges. A preface by Dr. Gladys Stevenson, professor of home economics at Whittier College, Los Angeles, tells the story of food "standing time" before baking in the automatic gas range.

Following general directions for clock controlled cookery, the book presents 12 complete menus with individual recipes for meals to serve from four to eight persons. These menus were submitted by home service directors in the following companies: Southern California

Gas Co., Southern Counties Gas Co., San Diego Gas and Electric Co., Portland (Ore.) Gas and Coke Co., Pacific Gas and Electric Co., San Francisco, Mountain Fuel Supply Co., Salt Lake City; Coast Counties Gas and Electric Co., Santa Cruz and Concord, and British Columbia Electric Co., Vancouver, B. C.

Copies are available from the Promotion Bureau, American Gas Association, 420 Lexington Ave., New York 17, N. Y. Price is 15 cents each in any quantity (discount of one-third to PAR Plan subscribers).

Production conference

(Continued from page 28)

Natural Gas," by Vincent Salzone, Consolidated Edison Co. of New York, Inc., A. G. Hall, The Brooklyn Union Gas Co., and R. S. Emanuel, Public Service Electric and Gas Co., Harrison, N. J.

Wednesday morning's meeting will close with a progress report on A. G. A. Gas Production Research.

Four luncheon conferences have been scheduled for Wednesday, beginning at 12:30.

Subcommittee on Carbonization and Coke, will meet with H. C. King, Rochester Gas & Electric Corp., presiding. Topics include Safety and Unusual Accidents; Controlling Coal Mixing by Automatic Weighing Devices; Pushing According to Temperatures Shown by Radiation Pyrometers; Repairing Ends of Gun Blocks; Variations in Gas Quality Which Determine Where Gas is Burned for Underfiring Coke Ovens. J. M. Spees, Koppers Co., Inc., Kearny, N. J. will act as alternate chairman.

At the same time, the Subcommittee on Use and Handling of LP-Gases, A. B. Lauderbaugh, The Manufacturers Light & Heat Co., Pittsburgh, presiding, will concentrate on the general field of safety. S. W. Horsfield, Long Island Lighting Co., is vice-chairman.

Subcommittee on Water Gas, with G. L. Bixby, Consolidated Edison Co. of New York, Inc., as luncheon chairman has scheduled the following topics: Fuel Bed Reforming; Clinker Formation; Refractory Maintenance; Stoppage in Sets, Mains, and By-Product Apparatus; Safe Practices with Natural Gas; Plant Wastes; Maximum Economy in Use of Natural Gas; LP as Substitute for Natural Gas; Safety in Water Gas Operation. B. L. Peables, Blackstone Valley Gas & Electric Co., Pawtucket, R. I., will be alternate chairman.

The fourth luncheon group to meet on Wednesday is the Subcommittee on Chemistry in the Gas Industry. Dr. H. J. Rose, Bituminous Coal Research, Inc., Pittsburgh, will preside. General subject

at this luncheon conference will be safety in chemistry in the gas industry.

Ohio Fuel wins

(Continued from page 8)

their fellow workers, who are always alert to maintain our safety record."

The latest A. G. A. certificate is the fourth won by the district. It follows citations given on completion of each succeeding million hours of work without a disabling injury.

Mr. Kadel summed up his own convictions very briefly: "Safety is the result of getting every individual interested. Add to that constant reminders to supervisors that they are just as responsible for the safety and well-being of the men in their care as they are for getting the job done."

Ohio Fuel Gas is getting its safety job done, and done thoroughly! Many other companies in the gas industry are "sold on safety" too. Is your company one of them?

Annual reports depict strong gas industry

EACH passing year focusses more attention on the company annual report. It is recognized more and more widely as one of the best means of getting the company's story across to its stockholders and public.

Following are excerpts from the first 1950 annual reports to reach the MONTHLY office. Here is a picture of a vigorous and growing gas utility industry.

• **The Peoples Gas Light & Coke Company**—During 1950, the company observed completion of a century of continuous gas service in Chicago. Peoples Gas, the principal company in an integrated system serving 1,700,000 customers, is in the midst of a major expansion program to supply more natural gas to Chicago and customers in the Middle West.

Revenues from gas sales in Chicago reached an alltime high in 1950 of \$49,043,662, an increase of 16.7 percent over 1949. Appliance sales figures show that more people are cooking with gas in Chicago than ever before. The list of applicants waiting for residential space heating in Chicago now numbers more than 90,000 families.

James F. Oates, Jr., chairman, announced that important progress is being made on the new 1400-mile, 30-inch Texas Illinois pipeline. The company is searching for a

large-scale underground natural gas storage area to serve Chicago.

• **The Columbia Gas System, Inc.**—Stuart M. Crocker, president, reports that revenue from sales was highest in the system's history—\$159,886,000. Gas revenues alone totaled \$150,379,000, an increase of 31 percent over 1949.

Operating expenses and payroll jumped during the year, too. Operating expenses were up 25 percent over 1949, to \$133,478,000, and payroll figures were \$28,677,000 against \$26,828,000 the previous year.

Columbia Gas System sold 343,712,614 Mcf in 1950, an increase of 32.5 percent in the year. To meet these large demands, underground storage operations were explored even further, and plans for future exploration and construction were formulated.

Security measures have been taken to provide protection to the system's employees and properties. Vital records have been microfilmed. Plans are nearing completion to provide alternative operating headquarters and living facilities in event of disaster.

• **United Gas Corp.**, Shreveport, Louisiana—During the year all classes of revenues increased over the preceding year. Natural gas sales in 1950 totaled 596 billion cubic feet, compared with 510 billion cubic feet in

1949. Revenues from natural gas sales in 1950 were \$75,057,473, an increase of \$11,489,787 over 1949.

The system continued its policy of increasing reserves of gas both by development of its own properties and by contracting for additional gas. United Gas Pipe Line Company has applied for authorization to build approximately 1,000 miles of large diameter pipelines to enlarge and reinforce its system.

A modern industrial research laboratory was completed and occupied in September. The public relations program was expanded and notable progress made in systemwide farm youth activities.

• **The Connecticut Light & Power Company**—Operating revenues for 1950 rose to \$43,526,000, an increase of \$3,775,000 over 1949. Total gas sales increased from 1949's 7,130,000 mcf to a new high of 7,921,000 mcf.

Planning for even the short-term future is difficult, states R. H. Knowlton, president. Material and manpower shortages must be overcome to meet consumer demands as well as new defense needs. New applications of gas in industry place an additional responsibility on the company. The company has initiated a cooperative industrial development program under direction of the public relations department.

Southeastern Michigan assured natural gas

SOUTHEASTERN Michigan Gas Co., Port Huron, recently acquired the gas properties formerly operated by Detroit Edison Company. Simultaneously, personnel of Detroit Edison's gas division in the area switched to the Port Huron company. William H. Huffmaster is

remaining with the group as general manager.

When Southeastern earlier this year received its first allocation of natural gas for Port Huron, the event was signalized by special articles and advertisements in the local newspaper. A full-page notice announced the grand

opening of the company's new offices and salesroom.

Conversion of appliances is now under way, according to Cecil A. Runyan, president, Southeastern Michigan Gas Company.

Gas companies report progress in defense

• **Indiana**—Roy B. Leckie, Central Indiana Gas Co., Marion, Ind., has been named chairman of the Gas Utility Section of the Utility Defense Committee of Indiana, which was initiated recently by the Public Service Commission. Carl D. Kantner, Citizens Gas and Coke Utility, Indianapolis, has been named secretary.

The Gas Utilities Section consists of all of the 19 gas utilities and gas transmission lines in Indiana, which are cooperating in establishing and planning civilian defense.

One of the major projects includes the mapping of gas resources of the state to determine adaptability and the tying-in of cities in event of disaster. A. B. Brown, Southern Indiana Gas and Electric Co., Evansville, has been named chairman of this committee.

Recommendations on plant civilian defense for all utilities and pipe line companies have been coordinated and are ready for presentation to the Public Service Commission. R. N. Schahfer, Northern Indiana Public Service Co., Hammond, was chairman of this project.

Other projects still in the formative stages include technical aspects concerning manpower, equipment, material, transportation, and public information.

This committee has been working closely with American Gas Association, and is particularly interested in covering matters not

developed by local, county, and city defense groups.

• **Brooklyn, N. Y.**—Protective measures under consideration by the defense corps of The Brooklyn Union Gas Company fall into four general categories—preservation of company records, safeguarding of employees and customers, protection of company properties, and promotion of community welfare.

Protection of records—A method similar to that used in World War II has been established for duplication and storage of vital company records. Records are being classified as either vital, important or unimportant. Those classified as either vital or important are being duplicated by various means. Typical vital records are maps of mains and company properties. Some 20,000 maps, about 5,000 personnel records and approximately 400,000 records of gas services, as well as numerous other items, will be duplicated.

Protection of employees—Shelter areas have been established and instructions are being issued for all company locations. Company doctors are recommending first aid measures and outlining items that should be carried in emergency kits. Air raid posters with instructions have been placed at all company locations.

Protection of properties—Orders relating to identification of personnel, visitors and con-

tractors' employees entering plants and holder stations have been issued. Similar instructions cover trucks entering the works.

Plant personnel have been advised or are being advised as to how, when and where to report for work in case of an attack. A plan of action is being worked out for both the plants and company offices. In addition, a chief inspector of guards is investigating fences and other devices, stiffening gate procedure and making recommendations for other protective equipment for plants and properties.

Public welfare—Major concern here is the maintenance of gas service. Steps have been taken to enroll all the engineering and mechanical forces in the company's civil defense group. These employees are signing up on New York City forms but will work under the direction of the company defense group. Their duties will be to keep the plants operating and to make necessary repairs. There will be a valve force to act to shut off valves in the distribution system in an emergency. Street mechanics will make repairs to damaged mains.

Additional radio transmitting and receiving sets have been ordered for installation at the general office and various gas stations.

To date more than 1,600 employees have joined the company's defense program.

Weaver retires as head of Ohio Fuel Gas

C. I. WEAVER, chairman of the board of directors and chief executive officer, The Ohio Fuel Gas Co., Columbus, Ohio, retired last month after serving as head of the company for 20 years. He continues as a director.

Mr. Weaver's executive responsibilities have been assumed by E. C. Overbeck who was elected president of Ohio Fuel Gas a year ago. W. N. Grinstead is vice-president and general manager.

Mr. Weaver joined the company in 1930 as vice-president and general manager. He was elected president in 1931. Mr. Weaver continued as chief executive officer on his advancement to chairman of the board last year. Cur-

rently he is a member of American Gas Association, president of the Ohio Chamber of Commerce and a director of the U. S. Chamber of Commerce. He previously was a director of Columbia Engineering Corp., an affiliate of The Columbia Gas System, Inc.

During his 20 years as chief executive of Ohio Fuel Gas the company has expanded all phases of its operations. The volume of gas handled has increased from a low of 46 billion cubic feet a year to 131 billion cubic feet in 1950. Mr. Weaver conceived the idea of using underground storage methods to place out-of-state gas in depleted Ohio fields during summer months. From a modest beginning of 33 million cubic feet of gas stored underground

in 1933, this program has grown until 53 million cubic feet were stored in four Ohio Fuel Gas areas at the start of the 1950-51 heating season. In order to get greater amounts of gas from the Southwest in 1946, Mr. Weaver joined with officials of The Columbia Gas System and public utilities commissions of seven states to obtain transfer of the Big and Little Inch pipelines to transmission of natural gas.



C. I. Weaver

Consolidated Natural officials elected

H. D. BORGER has been elected vice-president of The Peoples Natural Gas Company. Fenton H. Finn has been named vice-president of New York State Natural Gas Company. Both companies are subsidiaries of Consolidated Natural Gas Company.

Mr. Borger has been treasurer of The Peoples Natural Gas Company since November, 1942. He will continue in that capacity.

Mr. Finn has served as chief geologist for Consolidated Natural since January 1943 and will continue in that post. Both men are members of American Gas Association.



H. D. Borger



F. H. Finn

Personal
and
otherwise

Gas expert retires from Consolidated Edison

COLIN C. SIMPSON, assistant vice-president, Consolidated Edison Co. of New York, Inc., and a recognized authority on gas distribution systems, retired March 1 after more than 40 years of public utility work.

Mr. Simpson began his long career as a surveyor's rodman during school vacations. Before his thirtieth birthday he was general su-

perintendent of mains and services for Consolidated Gas Co., later a part of the Consolidated Edison System. As smaller gas companies merged with Consolidated Gas, it was Mr. Simpson's job to link the mains into an integrated city-wide system.

He frequently was called upon by other

utilities for advice. The industry generally recognized his authority in the fields of design, operating procedures, fault handling and the cause and cure of gas explosions. He was regarded as an expert witness at Public Service Commission hearings concerned with gas company operations.

Connecticut utility announces appointments

FOUR APPOINTMENTS have been announced by officials of The Connecticut Light and Power Company. Robert G. Ely has been named director of sales, and Howard Memmott, industrial manager. Leo A. Mayo, supervisor of local accounts, has been named to the newly-created post of director of methods. Marcel F. Young has been made supervisor of customer accounting and will assume Mr. Mayo's former duties.

Mr. Ely received his mechanical engineering degree from Cornell University in 1926 and joined Public Service Electric & Gas Co., Newark, N. J., in September of that year. In 1937 he was named assistant manager of power sales for the company.

Mr. Memmott received his degree from Brown University in 1933. In 1949 he became industrial power engineer for the utility's entire Eastern division.

Mr. Fleming's duties will consist of developing a program of work simplification for various departments of the company.

The new director of methods began his utility career in 1922 for Waterbury Gas Light Company as bookkeeper. He later became



R. G. Ely



H. W. Memmott



L. A. Mayo



M. F. Young

auditor for that company. In 1929, Mr. Mayo went to Hartford as supervisor of local accounts for Connecticut Light & Power and has since been in charge of all customer accounting throughout the company's service territory. He has served as chairman and member of accounting committees of American Gas Association, Edison Electric Institute and the New England Gas Association.

Mr. Young joined Meriden Gas Light Com-

pany in 1920. After that company was merged with Connecticut Light & Power, he became traveling auditor in 1926 with the company's Hartford staff. He was transferred to Waterbury in 1936 as supervisor of tabulating and billing. Mr. Young has served as a member of the accounting committee of Edison Electric Institute and as director, secretary and treasurer of New England Gas Association. He is now vice-chairman of the gas association.

Mountain Fuel Supply elects new officers

A NEW chairman of the board and a new president have been elected for Mountain Fuel Supply Co., Salt Lake City, Utah. New chairman of the board is J. C. Donnell II who has served as company president since 1942. W. T. Nightingale, vice-president in charge of production, exploration, and transmission since 1943, is the new president.

The changes resulted from retirement of T. B. Gregory as chairman of the board and company treasurer. Mr. Gregory will continue as a member of the board. J. D. Roberts, Salt Lake City, remains as vice-president in charge of all distribution divisions.

New treasurer is L. C. Olpin who has served as secretary since 1942 and as assistant treasurer since the company was organized in 1935. He also continues as secretary.

L. C. Peschel has been elected to the newly-created position of company controller.

The new chairman of the board graduated from Princeton University in 1932. He is at present vice-president, American Petroleum Institute, and chairman of the division of production. Other trade groups with which he is affiliated include American Gas Association and Mid-Continent Oil and Gas Association.

Mr. Gregory long has been an eminent oil



J. C. Donnell II



W. T. Nightingale



J. D. Roberts



L. C. Peschel



L. C. Olpin

and gas producer. He has served as assistant to the director of oil production, United States Fuel Administration, and later, during World War I, was director of the Bureau of Natural Gas of the United States Fuel Administration.

The new president received his bachelor of science degree from University of Washington in 1919, and his master of science degree there in 1924. In 1929, Mr. Nightingale became chief geologist with Mountain Fuel, serving in the capacity until 1945. He was elected a vice-president in 1941, and in 1945 became vice-president in charge of exploration, production, and transmission. He is a member of American Gas Association.

Mr. Roberts graduated from Lafayette College, Easton, Pa. in 1915 with the degree of mechanical engineer. For the nine years prior to coming to Utah, he was with Lone Star Gas Co., Dallas, in various engineering capacities.

Mr. Roberts became vice-president and gen-

eral manager of Utah Gas & Coke Co., Ogden Gas Co., and Wasatch Gas Co., predecessors of Mountain Fuel Supply Company. Since 1935, when Mountain Fuel Supply Company was organized, he has been vice-president in charge of distribution, in charge of all operations of the company in the Salt Lake Valley. He has been a director since 1940 and a member of the executive committee since 1941.

Mr. Olpin graduated from the University of Utah in 1922. He was auditor of Utah Gas and Coke Company from 1923 until 1929 when natural gas came to Utah. At that time he was named assistant secretary and assistant treasurer of the companies that in 1935 became Mountain Fuel Supply Company. He became a company director in 1940.

Mr. Peschel has been with Mountain Fuel and its predecessors since 1929. Since 1935 he has been assistant secretary and assistant treasurer of the company.

Horton takes new Pacific Public Service post

ELECTION of J. K. Horton to the newly-created position of executive vice-president was announced March 6 by Pacific Public Service Co., San Francisco, following a meeting of the board of directors. Mr. Horton has been

secretary and legal counsel of the company since 1945, and a director of the company's subsidiary, Coast Counties Gas and Electric Co., Santa Cruz, Calif., since 1948.

At the same meeting, A. R. Bailey was

elected a vice-president. Mr. Bailey has been a director since 1949, and a vice-president in charge of operations of Coast Counties Gas and Electric Company since April 1948. Both men are members of American Gas Association.

Two executives named by Amarillo Gas Company

ON MARCH 13, W. L. Smith was named vice-president and general manager, Amarillo (Texas) Gas Company. M. B. Edquist was named vice-president in charge of distribution operations.

Mr. Smith started with Amarillo Gas Company in 1927. He transferred in 1932 to West

Texas Gas Co., an affiliate, and served as manager of that company's Canyon District. He transferred again in 1932 to Amarillo Oil Co., another affiliate, as an accountant and later became an assistant auditor. In 1948 he returned to Amarillo Gas Company as assistant to the president.

M. B. Edquist commenced work for Amarillo Gas Company in 1935 following graduation from University of Kansas. In 1940 he was made assistant utilization engineer in the service department and in 1946 became utilization engineer in charge of the department.

West Texas Gas lists executive changes

R. F. HINCHEY, president of West Texas Gas Co., Lubbock, Texas, was named chairman of the board of directors at a meeting in Kansas City, March 13. C. I. Wall was named to succeed Mr. Hinchey as president.

Simultaneous announcements of four other promotions were also made. T. S. Whitis was named vice-president, transmission; H. F. Heath, vice-president, distribution; J. J. Wiley, vice-president, accounting and budget control, and R. M. Curry, assistant to the president.

Mr. Hinchey joined West Texas Gas Company as vice-president and general manager in June 1927. His first task was to supervise construction of a gas transmission line from the Panhandle Gas Field into the South Plains

of West Texas, and of distribution plants in the various cities and towns to be served.

His entire working life has been spent in the natural gas business. This year he will complete his forty-seventh consecutive year with the industry.

Mr. Wall first was employed with the company shortly after it was organized. His first job was checking pipe for the Panhandle to South Plains transmission line. Later he advanced to assistant purchasing agent, purchasing agent, local manager, superintendent of city plants, and vice-president in charge of operations, the job he held at the time of his recent promotion. He is a member of American Gas Association.

Mr. Whitis, Mr. Heath, Mr. Curry and Mr.



R. F. Hinchey



C. I. Wall

Wiley have been key men with the company for many years.

Pacific Lighting Gas Supply retains Sattinger

OSCAR C. SATTINGER, who formerly handled legal matters for Southern Counties Gas Co., has been retained as legal counsel by Pacific Lighting Gas Supply Company. The work Mr. Sattinger previously did for Southern Counties was taken over by Milford

Springer when the latter became secretary and counsel of that company on February 1.

Mr. Sattinger has been closely identified with the gas business in Los Angeles since he began his legal career there in 1921. As an associate during the 30-year period of LeRoy M. Ed-

wards, retired official of the supply company and the two affiliated distributing companies, he has confined his practice largely to matters concerning these organizations. He is a member of American Gas Association.

Gas experts head LP engineering firm

DRAKE & TOWNSEND, INC., a new company specializing in design, engineering and construction of propane plants, brings together two well-known oil and gas men. Headquarters are at 11 West 42 St., New York.

Harry W. Townsend, president, is one of the founders of Pacific Gas Corp., where he

specialized nationally in liquefied petroleum gas and L. P. G. plants for utility, industry and dealer.

Francis E. Drake, vice-president and treasurer, has been connected with gas in all of its phases. He started as a cadet with Lynn Gas & Electric Co., Lynn, Mass., finally becoming

manager of the gas department. As a vice-president of Utility Management Corp., he directed operations of 65 gas properties throughout the United States. For a number of years he has had charge of design and engineering for Pacific Gas Corporation.

Manufacturers announce personnel changes

• Robertshaw-Fulton Controls Company—W. E. Otis has been named administrative assistant to H. W. Geyer, director of the company's West Coast Research and Development Laboratory.

Mr. Otis was formerly with Southern California Gas Company where he developed and administered that company's field observation program. This program has received considerable recognition as an agency through which field usage reports are accumulated for review with involved manufacturers and ASA approval committees.

• Rockwell Manufacturing Co., Pittsburgh—Munro Corbin has been elected controller and I. C. Rowe, secretary. The controller's office was vacated by J. E. Ashman, vice-president, who in addition to his responsibilities with the headquarters office has been placed in charge of the power tool divisions.

Mr. Corbin joined Rockwell as an accountant in 1940 and was made assistant controller in 1947. He was formerly with the Manufacturers Light and Heat Company. Mr. Rowe came to Rockwell in 1941 as su-

pervisor of taxes for the company.

• American Stove Co., St. Louis, Missouri—John M. Bayer has been appointed regulations and priorities manager. Simultaneously, it was announced that Ambrose R. Pierce will replace Mr. Bayer as manager of the company's Lorain sales division. Mr. Bayer has been transferred temporarily from the sales department to the production department as an advisor to the production planning staff, and as an interpreter of Government orders and regulations relating to production.

Manufacturer joins ESA

WALTER E. KIRBY, manager of American Stove Company's Atlantic sales division, Philadelphia, has been named to a key position with the Economic Stabilization Authority.

One of the first representatives of industry to be appointed to ESA, Mr. Kirby will assume the Washington post immediately.

He has been an administrative officer of American Stove Company since 1923.

Beckjord honored

WALTER C. BECKJORD, prominent gas industry executive, has been elected president of the Cincinnati Symphony Orchestra Association. Mr. Beckjord is president, The Cincinnati Gas & Electric Co., a past-president of American Gas Association and is a prominent leader in civic affairs.

Wastie joins LP firm

PAUL E. PEACOCK, JR. has resigned as vice-president and chief engineer, H. Emerson Thomas and Associates, Inc., Westfield, N. J. to engage as an individual in LP-gas engineering in Westfield. H. Emerson Thomas and Associates, Inc. will continue to operate at its present location.

Arthur E. Wastie will replace Mr. Peacock as vice-president and chief engineer of the corporation. Mr. Wastie was formerly manager of the eastern office, Phillips Petroleum Co., on utility and industrial plants. He served in a similar capacity with Pacific Gas Corporation.

Praeger in PUAA post

HOWARD A. PRAEGER, manager of the publicity & advertising department, The Brooklyn Union Gas Co., has been elected chairman of region two, Public Utilities Advertising Association.

This region includes gas and electric utilities in New York, New Jersey, Pennsylvania, Maryland, Delaware and Washington, D. C. Mr. Praeger is currently vice-chairman of the Publicity and Advertising Committee, American Gas Association.

Cartwright promoted

THOMAS F. CARTWRIGHT was named a vice-president of Amarillo Oil Co., Amarillo, Texas, March 13.

He is well known in American Gas Association accounting circles, having been active for years on the General Accounting, Internal Accounting, and Taxation Committees.

Advertising manager for Consolidated Edison

APPOINTMENT of Edward A. Holmberg as manager, advertising department, was announced March 12 by Consolidated Edison Company of New York, Inc. Mr. Holmberg, who succeeds the late Dennis S. Melvin, will work with Ray Martin, director of advertising.

Mr. Holmberg, widely known in gas and electrical trade circles, has been identified with Consolidated Edison's sales activities for more than 40 years. He started with Brooklyn Edison Company as an office boy and was a salesman before World War I.

He was appointed a district sales manager in 1924 and from that time on advanced

through a series of executive posts concerned with sales and promotion. At one point, he was sales manager for both Brooklyn Edison and New York and Queens Electric Companies. Since 1946, Mr. Holmberg has been manager of Consolidated Edison's appliance promotion bureau.

AMERICAN GAS ASSOCIATION MONTHLY

Lucy Slagle advances

LUCY SLAGLE has been appointed home service supervisor for Atlanta Gas Light Co., Atlanta, Ga., following retirement of Cephalie Lewis earlier this year. Miss Lewis had completed 34 years of work in home service.

Miss Slagle has been a member of Atlanta's home service staff since 1939. In addition to her duties in Atlanta, she will assist and supervise division managers and home economics personnel of other divisions in their home service activities.



Lucy Slagle



E. A. Holmberg

Associated organization activities

Industry leaders to address SGA

A RECORD attendance of 1,400 is in prospect for Southern Gas Association's forty-third annual convention at Biloxi, April 23-25.

Sessions in the Buena Vista and Edgewater Gulf Hotels will present a distinguished list of speakers drawn from business and industry. A chief attraction will be the address at Tuesday morning's general session by D. A. Hulcy of Dallas, president of American Gas Association. Mr. Hulcy, president, Lone Star Gas Co., will sound the industry's challenge for the times, "A United Gas Industry Speaks."

Washington activities theme of GAMA meeting

THE WASHINGTON SCENE and its relation to the gas appliance and equipment industry will be the keynote of the annual meeting of the Gas Appliance Manufacturers Association. The meeting will be held at the Drake Hotel in Chicago on April 16 and 17, 1951.

Tuesday morning general session will be devoted to speakers who are members of various governmental departments. Beardsley Ruml, nationally known economic advisor,

General convention chairman is J. L. Campbell, New Orleans Public Service, Inc.

Tuesday morning's session also will include reports by SGA President Carl H. Horne, Alabama Gas Corp., Birmingham, and Managing Director Robert R. Suttle, Dallas. A talk, "Nearer Than You Think," will be given by the Gulfport (Miss.) editor-philosopher-humorist, Clayton Rand. Mr. Rand also will speak at the ladies' luncheon on Tuesday.

Wednesday morning's general session will hear Dr. Watrous H. Irons, vice-president, Federal Reserve Bank at Dallas, discuss "Economic Effects of the Federal Reserve System." Walter Couper, Industrial Relations Counselors, Inc., New York, will give "An Appraisal of Employee Relations Trends."

Wednesday's luncheon will feature Dr. Kenneth McFarland, superintendent of Topeka (Kan.) schools, on "Five Buckets of Paint." Officers will be elected and committee reports given.

Special meetings will be held by the accounting, distribution, employee relations, sales and transmission sections. In addition to featured addresses, a number of panel discussions are scheduled.

The home service luncheon Monday will be addressed on "Out of the Past and Into the Future" by E. Carl Sorby, vice-president, George D. Roper Corp., Rockford, Illinois.

The joint transmission-distribution-employee relations luncheon will be held Tuesday.

will summarize and answer questions.

The meeting will include divisional meetings and two luncheon sessions. One will be devoted to general GAMA business matters, and a second will hear representatives of the American Gas Association. An evening of "good fellowship" is planned for Monday night, April 16.

Frederic O. Hess, president of GAMA, will preside at the general sessions. He will deliver the president's address and will officially present the



C. H. Horne



J. L. Campbell

Speaker will be R. H. Hargrove, president, Texas Eastern Transmission Corporation.

An accident prevention forum will be held Monday morning with R. L. Conway, Jr., United Gas Corp., as chairman. The New SGA Safety Achievement Award will be discussed by Arthur J. Naquin, New Orleans Public Service Inc.

Section chairmen for 1951-1952, who will take over after the convention, are: Accounting—W. M. Wampler, Chattanooga Gas Co.; Distribution—H. R. Derrick, Alabama Gas Corp., Birmingham; Employee Relations—Harold F. Taylor, Oklahoma Natural Gas Co.; Sales—J. O. Jackson, United Gas Corp.; Transmission—Aubrey L. Roberts, Texas Gas Transmission Corp.; General Convention—Dale E. Frieden, Zenith Gas System, Inc., Alva, Oklahoma.



F. O. Hess

cially present the 1951 Meritorious Service Awards for outstanding contributions to the industry in the past year.

Leland M. Feigel, Savel, Inc., Evansville, Ind., is serving as program chairman for the meeting.

Hulcy talk on PAR Plan heads Indiana agenda

D. A. HULCY, president of American Gas Association, will headline the speakers' program for the forty-first annual convention of Indiana Gas Association at French Lick, Ind., April 26 and 27. Mr. Hulcy, president of Lone Star Gas Co., Dallas, will discuss "PAR at Work" during the closing session.

President C. K. Graham, Southern Indiana Gas and Electric Co., Evansville, Ind., reports that advance reservations indicate an attendance of 300 to 350. Mr. Graham is to be succeeded as IGA president by E. E. Lin-

burg, Richmond Gas Corporation.

A golf tournament sponsored by gas appliance and equipment manufacturers, and a banquet with entertainment, highlight the social program for the convention. Annual election of officers will be held the final day.

In addition to Mr. Hulcy's address, the speakers' program includes:

Thursday, April 26—"The Automatic Gas Clothes Dryer—A Great New Profit Opportunity," Charles Rippe, sales director, Hamilton Manufacturing Co., Two Rivers, Wis.;

"The Death of a Salesman—Its Implications in the Gas Industry Today," Howard D. Valentine, manager sales promotion, The Peoples Gas Light & Coke Co., Chicago, and "The Discovery and Development of Leadership in Industry," Dr. R. K. Burns, executive officer, University of Chicago.

Friday, April 27—"Trail Blazing in Industry," T. A. Boyd, research laboratories consultant, General Motors Corp., Detroit; "Americans Thrive on Struggle," Dr. M. O. Ross, president, Butler University, Indianapolis.

Large attendance forecast for LPGA

LIQUEFIED Petroleum Gas Association expects to attract nearly 2,000 persons to its twentieth anniversary convention and trade show in Chicago, May 7-10. Both the speaking program and the greatly expanded exposition of appliances and equipment will be held in the Hotel Stevens.

Speakers scheduled to address general sessions include James E. Pew, manager, natural gas and natural gasoline division, Sun Oil Co., Philadelphia, Pa.; Dr. Sylvia A. Sorkin, prominent lecturer on public relations subjects; Lee A. Brand, vice-president, Empire Stove Co., Belleville, Ill., and chairman of the Na-

tional Committee for LP-Gas Promotion, and Howard D. White, LPGA executive vice-president, Chicago.

Peter A. Anderson, Utilities Distributors, Inc., Portland, Me., president of the association, will preside at the general sessions.

(Continued on page 43)

OBITUARY

E. Holley Poe



E. Holley Poe

prominent figure in the gas industry who formed Texas Eastern Transmission Corporation which purchased the Big and Little Inch pipelines from the government in 1947, died suddenly at Tulsa, Okla., on March 9, 1951.

Mr. Poe was secretary of the Natural Gas Department, American Gas Association beginning in 1937. Prior to that he worked for several newspapers and oil companies in Oklahoma. From 1926 to 1936 he was manager of the Oklahoma properties of Central States Power and Light Corporation. During World War II he was director of the Natural Gas and Natural Gasoline Division, Petroleum Administration for War.

He was also executive vice-president of the Petroleum Reserves Corporation under the Department of the Interior.

He was the first president of Texas Eastern Transmission Corporation which was first to deliver natural gas to New York City when, in August 1949, it started to serve New York and Richmond Gas Company on Staten Island. Deliveries were made through the Big and Little Inch pipelines which the company had converted from oil to natural gas.

In 1944 Mr. Poe formed a consulting firm, E. Holley Poe and Associates with offices in

New York, Washington, and Chicago. He was president and treasurer of *American Gas Journal*, one of the oldest business periodicals in the country. The magazine was established in 1859.

In addition, he was a director of Texas Eastern Transmission Corp., vice-president and director of Atlantic Venezuela Transmission Corp., vice-president and treasurer of United States Pipe Line Co., chairman of the board of Venezuela Research and Development Corp., chairman of the board of North American Petroleum Gas Corp., director of New Brunswick Oilfields, Ltd., and president of Northeast Utilities Corp., Stamford, Connecticut.

Mr. Poe was also a partner in Edward W. Ackley and Co., investment brokerage firm in Boston.

Surviving are two sons, Robert M. Poe and Richard H. Poe; one sister, Myrtle Poe; four brothers, John H. Poe and Roy R. Poe, Lane Poe and Lewis M. Poe.

James W. Moore

manager of the special products division, American Cast Iron Pipe Co., Birmingham, Ala., died on March 3, 1951. He was a member of American Gas Association.

Dennis S. Melvin

advertising department manager, Consolidated Edison Co. of New York, Inc., died on February 27 at the age of 54.

Mr. Melvin joined Consolidated Edison System in 1929 as a district salesman. He then served as manager of the appliance promotion bureau in the sales department, and as manager of the construction contracts bureau in the purchasing department, before being appointed to his post in advertising.

He is survived by his wife, Georgiana; a son, Gerald; two sisters, Mrs. Warren J. MacMillan and Mrs. Lyman Noble, and two brothers, Thomas and Jay.

Robert Weidaw

merchandise advertising manager for The Connecticut Light & Power Co., died on February 21 in Wethersfield, Connecticut.

Widely known in utility advertising circles, Mr. Weidaw served Connecticut Light & Power Company as merchandise advertising manager for 24 years. He won widespread recognition for his campaigns to develop consumer acceptance of gas and electric household appliances. He was an authority on proper store layout, and designed numerous display rooms and demonstration auditoriums.

Prior to his service with Connecticut Light & Power, Mr. Weidaw was associated with Adirondack Power & Light Co., Schenectady.

He is survived by his wife, Margaret, a daughter, Janet, several brothers and sisters.

Arthur S. Hall

superintendent, Springfield Gas Light Co., Springfield, Mass., died suddenly in a Springfield hospital on Sunday, March 4. He was a former president of the Guild of Gas Managers, and a prominent member of several committees in American Gas Association and New England Gas Association.

Mr. Hall's first connection with the gas industry was with Malden & Melrose Gas Light Co., Malden, Massachusetts. From there he moved to the East Boston plant of what is now Boston Consolidated Gas Company. Later he served with Pintsch Gas Company in Pittsburgh.

He moved to Springfield in 1905 and became superintendent in 1914. He also did consulting work on retort construction in Malden & Melrose Gas Company and Fitchburg Gas & Electric Company.

Besides his wife, he leaves a son, Arthur Gordon Hall; a daughter, Mary Hall Furber, and a grandson, Arthur Gordon Hall, Jr.

Underground storage

(Continued from page 12)

billion cubic feet.

Old wells are conditioned for receipt of storage gas by thorough checking for water and cavings, which are removed upon discovery.

New York State Natural Gas Corp., Pittsburgh, Pa., and Texas Eastern Transmission Corp., Shreveport, La., are joint owners of another large field—the Oakford Gas Storage Project about 20 miles east of Pittsburgh. The site is an exhausted gas field, one of the first to be developed in the Pittsburgh region.

This large project is Texas Eastern's only underground storage field at present. Both companies are currently engaged in injection of base gas. When the field is developed to its present de-

sign capacity of 105 billion cubic feet (60 billion circulating and 45 billion base), the two companies together will be able to withdraw about 400 million cubic feet of gas daily for 150 days.

This project will have no connection with New York State Natural's present business or facilities, but will be operated for the benefit of two sister companies, The Peoples Natural Gas Company and The East Ohio Gas Company. These last three concerns are subsidiaries of Consolidated Natural Gas Company.

On October 31, 1950 The Peoples Natural Gas Company had in storage 11,636,488,000 cubic feet of gas. New York State Natural had 13,597,695,000 cubic feet stored underground at that time. Present storage capacity for Peoples Natural is about 13 billion cubic feet, and for New York State

Natural, about 51 billion cubic feet. Present development operations will add approximately 118 billion cubic feet capacity to New York State Natural's underground storage system.

On March 15, 1951, Peoples Natural had nine active underground storage fields with one field under development and expected to be in operation this year. New York State Natural currently has three pools in operation and another due to be operational later this year. These fields are strategically located near the market areas of both companies.

Approximately 50 percent of the gas in storage for the last two companies is available for withdrawals. During a peak day, about 40 percent of the gas supply is storage gas.

Both Peoples Natural and New York State Natural redrill all aban-

done wells and recondition all active wells in the storage area before injecting gas into the reservoirs. Experience has shown that it is impossible to operate a storage area without both these operations.

It is also common practice at present to cement casing to the surface and to equip wells for pressures well above contemplated maximum storage pressure. All storage wells used for inputs and withdrawals are equipped with both pressure recording gauges and individual orifice meters. These meters are in addition to the master meters used for measurement at compressor stations.

The Peoples Gas Light & Coke Co., Chicago, faced with tremendous unfilled demand for natural gas for house heating, is pushing the search for underground storage through its affiliates, Natural Gas Pipeline Co. of America and Texas Illinois Natural Gas Pipeline Company. These two firms are now conducting a geological investigation to determine the feasibility of storing large quantities of natural gas in underground domes of porous and permeable sandstone.

The search is being conducted in an area west of Kankakee County, Ill., which is believed to contain a large dome-shaped and gas-tight rock formation below the surface. Geologists are attempting to determine that a suitable stratum of permeable water-bearing sandstone underlines the dome or cap at a depth of approximately 1,600 feet.

Drilling tests under way thus far indicate that the geological structures in the area may prove satisfactory for storage of gas.

Natural gas from the pipeline systems could be injected into the sandstone trap under sufficient pressure to press back the salt water and hold the stored gas in a great bubble until it is needed.

The Kankakee County region lies close to terminals of both pipeline systems.

Studies have also been made of the feasibility of excavating caverns in suitable limestone formations in which gas could be stored. The resulting caverns would, if necessary, be cemented to prevent escape of gas stored under moderate pressure. Use of depleted oil and gas fields for storage is limited in

Illinois because exhausted fields are confined to the southern section of the state.

Enabling legislation is a necessary preliminary to any storage project in Illinois. However, a bill that would grant the use of eminent domain for development of underground gas storage facilities has been introduced in the State legislature.

Transcontinental Gas Pipe Line Corp., Houston, Texas, owner of the 1,840-mile Texas-New York natural gas line, has not developed underground storage fields as yet. However, the company is currently sponsoring an intensive search along the Atlantic Seaboard for structural formations suitable for natural gas storage. As soon as the desired storage areas are located, the company will take steps to secure the necessary rights of use.

Tennessee Gas Transmission Co., Houston, Texas, and United Natural Gas Co., Oil City, Pa., are seeking authorization for facilities to develop and utilize an underground storage area in the Hebron Field in Pennsylvania. The project would include 70 wells and 70 well measuring stations and would be owned jointly by the two companies.

When developed, the area would have a capacity of 22½ billion cubic feet of active gas. It would be able to deliver at least 225 million cubic feet a day. Tennessee proposes to inject approximately 23,800,000,000 cubic feet of cushion gas into the storage area.

A Kentucky company, Texas Gas Transmission Corp., is embarking on an underground gas storage program to meet expanding market demands for natural gas in its mid-western service area. The proposed Alford underground storage field near Petersburg, Ind., would enable the company to supplement its peak deliveries of natural gas by 30 million cubic feet a day. When completed, the field will hold four billion cubic feet of gas. Texas Gas now operates a storage field at Oaktown, Ind., capable of delivering six million cubic feet a day. Additional storage plans will be announced in the near future.

A number of applications for underground storage were made by other companies during the early part of 1951:

The Ohio Fuel Gas Co., Columbus, has requested permission to construct facilities for conversion of six natural gas producing fields in Ohio to storage pools. The pools have an ultimate storage capacity of about 35.7 billion cubic feet.

Equitable Gas Co., Pittsburgh, hopes to construct a new compressor station in Washington County, Pennsylvania. The new facilities would help to boost pressure in the Bunola pool, creating a delivery capacity of about 80 million cubic feet a day.

Mississippi River Fuel Corp., St. Louis, Mo., has received temporary authorization to build facilities for testing gas storage possibilities of the Waterloo Oil Field in Illinois. Up to seven gas wells will be drilled and operated.

Technical aspects of underground storage have been widely publicized. A complete bibliography of articles on underground storage appearing in A. G. A. publications and gas industry trade magazines was published by the Association in December 1950. Copies of the bibliography are available without charge from the A. G. A. Library in New York.

LPGA convention

(Continued from page 41)

The Marketers Section will hear talks by E. Carl Sorby, Geo. D. Roper Corp., Rockford, Ill.; Carroll Willis, Siebert & Willis, Inc., Wichita, Kans., and Stanley Gorman, water heater promotion manager, Gas Appliance Manufacturers Association.

K. J. Forderbrugen, Minnesota Valley Natural Gas Co., St. Peter, Minn., chairman of the Utilities Section, has announced that his group will hear a presentation by Harry Andrews, vice-president, United Petroleum Gas Co., Minneapolis. Wielding the gavel at the other four divisional meetings will be Pierre Vinet, Geo. D. Roper Corp., chairman, Appliance Manufacturers Section; Joseph Kettner, Delta Tank Manufacturing Co., Baton Rouge, La., chairman, Equipment Manufacturers Section; H. W. Rigerink, Sun Oil Co., Philadelphia, Pa., chairman, Producers Section, and Paul Thompson, Standard Oil Co. (N. J.), New York, N. Y., chairman, International Section.

Philadelphia safety council

A WELL KNOWN utility figure has been named chairman of the Safety Council, Greater Philadelphia Chamber of Commerce. Roy M. Godwin, new chairman of the council's board of governors, is manager of the safety department, Philadelphia Electric Company. He has been active in affairs of the Safety Council ever since it became an important component of the Philadelphia Chamber of Commerce.

Natural gas reserves

(Continued from page 6)

have not yet been applied.

(5) Oil that may become available through chemical processing of natural gas.

(6) Oil that can be made from oil shale, coal, or other substitute sources.

Proved reserves are both drilled and undrilled. The proved drilled reserves, in any pool, include the oil estimated to be recoverable by the production system now in operation, whether with or without fluid injection, and from the area actually drilled up on the spacing pattern in vogue in that pool. The proved undrilled reserves, in any pool, include reserves under undrilled spacing units which are so close, and so related, to the drilled units that there is every reasonable probability that they will produce when drilled.

This committee uses the term "fluid injection" to include (1) what is commonly called "pressure maintenance"; (2) cycling and re-cycling; and (3) secondary recovery in its original sense, namely, fluid applied relatively late in the development history of a reservoir (pool) with the purpose of stimulating petroleum production after recovery by primary methods of flowing and pumping has approached an economic limit. Since fluid injection methods may be installed at any time during the period of exploitation of a pool (or field), determination of those reserves which might be obtainable without fluid injection, and those which might be obtainable as a result of fluid injection, would be impossible.

In the case of new discoveries, both of new fields and of new pools (pays, reservoirs) in old fields, which are seldom fully developed in the first year and in fact for several years thereafter, the estimates of proved reserves necessarily represent but a part of the reserves which may ultimately be assigned to the new reservoirs discovered each year. For a one-well field, where development has not yet gone beyond the discovery well, the area assigned as proved is usually small in regions of complex geological conditions but may be larger where the geology is relatively simple. In a sparsely drilled pool the area between wells is considered to be proved only if the geological and engineering data assure that such area will produce when drilled.

The total of new oil through discoveries estimated as proved in each year is comparatively small, because development is usually not extensive during the first year. The total of new oil through extensions, on the other hand, is comparatively large. As knowledge of the factors affecting production and reservoir performance becomes available, and as these factors are studied, reserves in older fields can be estimated with greater precision and revised accordingly. Therefore, the total quantity of the new proved reserves for the year includes the oil from discoveries, extensions and revisions of previous estimates.

The committee again stresses the fact that its estimates of proved reserves cannot be used in measuring the rate at which these reserves can be produced with or without physical waste. Oil cannot be produced from the permeable rocks in which it occurs at any desired rate, because the flow of oil through the

TABLE 3 SUMMARY OF ANNUAL ESTIMATES OF NATURAL GAS RESERVES
FOR PERIOD DECEMBER 31, 1945 TO DECEMBER 31, 1950

(Millions of Cubic Feet—14.65 psia, at 60 deg. F)

Year	Natural Gas Added During Year			Net Change In storage	Net Production During Year	Estimated Proved Reserves as of Year End	Increase over Previous Year
	Extensions and Revisions	Discoveries of New Fields and New Pools in Old Fields	Total Discoveries, Revisions, Extensions				
1945	.....	.....	.....	.....	.....	147,789,367	.....
1946	a	a	17,729,152	a	4,942,617	160,575,901	12,786,535
1947	7,570,654	3,410,170	10,980,824	a	5,629,811	165,926,914	5,351,013
1948	9,769,483	4,129,089	13,898,572	51,482	6,007,628	173,869,340	7,942,426
1949	8,061,429	4,612,870	12,674,299	82,746	6,245,041	180,381,344	6,512,004
1950	9,172,381	2,877,351	12,049,732	54,301	6,892,678	185,592,699	5,211,355

a Not estimated.

TABLE 4 SUMMARY OF ANNUAL ESTIMATES OF NATURAL GAS LIQUIDS RESERVES
FOR PERIOD DECEMBER 31, 1946 TO DECEMBER 31, 1950

(Thousands of Barrels of 42 U. S. Gallons)

Year	Natural Gas Liquids Added During Year			Net Production During Year	Estimated Proved Reserves as of Year End	Increase over Previous Year
	Extensions and Revisions	Discoveries of New Fields and New Pools in Old Fields	Total Discoveries, Revisions, Extensions			
1946	.....	.....	.....	129,262	3,163,219	.....
1947	192,237	59,301	251,538	160,782	3,253,975	90,756
1948	405,874	64,683	470,557	183,749	3,540,783	286,808
1949	294,211	92,565	386,776	198,547	3,729,012	188,229
1950	707,879	58,183	766,062	227,411	4,267,663	538,651

pores of the oil-bearing rocks is definitely controlled by the physical factors of the reservoir. As a matter of fact, today's known oil can be recovered only over a period of many years and at gradually declining annual rates. This has been widely demonstrated by past performance under all kinds of operating conditions. Therefore, only incorrect conclusions as to the life of these reserves can be obtained by dividing these reserves by the current rate of production.

As in the past, this committee emphasizes the fact that every effort has again been made to secure a fair, unprejudiced, and representative opinion. Each member in his district appointed a number of subcommittees to gather and study the necessary data. All previously determined factors pertaining to the various pools were examined and adjusted in the light of new information. The subcommittees which were largely responsible for the data were comprised of geologists and petroleum engineers with long experience in this class of work.

Morale building

(Continued from page 24)

of a smile.

e. The importance of a job well done.
f. How to impress upon a customer your willingness to be of service.

g. How a good approach can become a warm welcome by a mere greeting, such as "Good Morning," when it is sincerely expressed.

There are innumerable subjects such as those mentioned above and so many ways to express them that even daily "Morale Lessons" would not exhaust material.

(2) *Check the material on hand.* Review previous training. Most gas companies conduct an employees training program, either training schools, manuals, training films, informal group discussions, or conferences.

All phases of training are morale builders. If we are able to do a job well we are satisfied with ourselves, we satisfy the customer and consequently management. Satisfied people are happy people. Happy people create happiness—a most important factor in morale. Training employees to do their job well becomes more important than ever in times like these because of manpower shortages. A well-trained employee is a great time saver. The "Morale Building Campaign" will not minimize the importance of

(a) CRUDE OIL - AMERICAN PETROLEUM INSTITUTE

(Barrels of 42 U. S. Gallons)	
Total proved reserves of crude oil as of December 31, 1949	24,649,489,000
Revisions of previous estimates	+663,378,000
Extensions of old pools	1,334,391,000
New reserves discovered in 1950 in new fields and in new pools in old fields	564,916,000
Proved reserves added in 1950	2,562,685,000
Total proved reserves as of December 31, 1949 plus new proved reserves added in 1950	27,212,174,000
Less production during 1950*	1,943,776,000
Total proved reserves of crude oil as of December 31, 1950	25,268,398,000
Increase in crude oil reserves during 1950	618,909,000

(b) NATURAL GAS LIQUIDS - AMERICAN GAS ASSOCIATION AND AMERICAN PETROLEUM INSTITUTE

(Barrels of 42 U. S. Gallons)	
Total proved reserves of natural gas liquids as of December 31, 1949	3,729,012,000
Revisions of previous estimates and extensions of old pools ..	+707,879,000
New reserves discovered in 1950 in new fields and in new pools in old fields	58,183,000
Proved reserves added in 1950	766,062,000
Total proved reserves as of December 31, 1949 plus new proved reserves added in 1950	4,495,074,000
Less production during 1950*	227,411,000
Total proved reserves of natural gas liquids as of December 31, 1950	4,267,663,000
Increase in Natural Gas Liquids reserves during 1950	538,651,000

(c) TOTAL LIQUID HYDROCARBONS - A.P.I. & A.G.A.

(Tables 1a and 1b combined)	
(Barrels of 42 U. S. Gallons)	
Total proved reserves as of December 31, 1949	28,378,501,000
Revisions of previous estimates and extensions of old pools ..	+2,705,648,000
New reserves discovered in 1950 in new fields and in new pools in old fields	623,099,000
Proved reserves added in 1950	3,328,747,000
Total proved reserves as of December 31, 1949 plus new proved reserves added in 1950	31,707,248,000
Less production during 1950*	2,171,187,000
Total proved reserves of liquid hydrocarbons as of December 31, 1950	29,536,061,000
Increase in Total Liquid Hydrocarbon reserves during 1950	1,157,560,000

* The 1950 production figures were compiled by the committee and where necessary are based on eleven months actual production with an estimate for December. Any variance between the actual production, as later reported, and the figures used herein will be compensated for through revision when the following year's reserve report is compiled. These revisions have in the past been very small.

job training, it will only emphasize those phases of training that deal with morale.

(3) *Morale building—an offensive campaign against war nerves.* It is much easier to have faith in your country and its future if you respect your fellow countrymen. Morale acts as a cushion to our nerves when the horrors of war are all around us—on the radio, television, motion pictures, newspapers, daily conversation, etc.

During the last war the destructiveness of subversive propaganda was highly publicized. If the necessity for good morale were publicized as effectively, few people would fail to realize how important it can be. Those who already realize its importance will not wait for a nation-

wide campaign but will start the ball rolling at home.

(4) *When the emergency is over.* Good morale will never be scrapped; it is also useful in peacetime. Time, effort and money spent in this campaign will not have been wasted when lasting peace is attained. It will help people to be at peace during peacetime.

If you doubt that the little you could do would accomplish anything, just remember this: The enemy realizes how destructive one disgruntled person can be and doesn't hesitate to go through tedious routines to cause unhappiness, dissatisfaction and unrest. If an enemy can work so hard to destroy our democracy, can we do less to preserve it?

Insurance

(Continued from page 14)

pense adequate and proper insurance with not less than the primary limits for public liability bodily injury and property damage. The insurance policy, a copy, or a certificate of insurance must be deposited with the utility and the employee must promptly report any changes in his insurance coverage or change in auto. Compensation to the employee is usually on a mileage basis which includes an allowance for the insurance. The utilities generally do not require that they be named as additional insured under the employee's policy. The standard insurance contract form includes as "insured—any person or organization legally responsible for the use thereof, provided the actual use of the automobile is by the named insured or with his permission."

Having outlined the principal responsibilities of utilities directly associated with insurance, it might be well to set up a brief example of a utility's over-all insurance program as it might exist today.

Based on experience, the larger utilities have generally adopted a combined program of self-insured risks and specific outside insurance. The principal reason for a combined program is the substantial saving in out-of-pocket premiums for the self-insured risks and the advantage in the administration and handling of all investigations and settlement of claims.

In addition, the utilities are in a position, realizing the experience of the self-insured risks, to make changes in the form and amounts of outside insurance in line with the experience and extent of the outside insured risks, such as increasing the limits and adjusting the amount of deductible in outside excess liability insurance contracts. The elimination of outside coverage on certain facilities of the utilities' properties, such as the excavation, grading, filling, etc. for buildings and equipment; parts of buildings and equipment located underground or below the level of the lowest basement floor. There is always the opportunity and advantages of improving outside insuring contract forms and in many cases the adoption of manuscript forms in lieu of standard forms of the insuring company. Utilities should also take every advantage in extending their insurance markets in all forms of outside insurance.

* Amounts to be determined by managerial judgment.

Assuming that such a combined program over a period of time has resulted in the building up of a reasonable and/or adequate insurance reserve, the self-insured risks could be as follows:

A. Workmen's Compensation claims and expenses up to (\$*) for any one occurrence.

B. Third party public liability bodily injury and property damage losses up to (\$*) for each occurrence.

C. Losses for fire, theft, collision and upset; including public liability property damage in connection with utilities' automotive equipment. This also includes self-insurance under the new Financial Responsibility Law.

D. Automobile public liability bodily injury losses up to (\$*) for each occurrence.

E. Loss or damage to utilities' property arising out of earthquake, flood, water, windstorm, smoke, hail, plate glass, riot, strike, civil commotion, automobile, aircraft, and explosion (other than separately insured).

F. Loss of property, money, security, as a result of theft, burglary, holdup, etc.; and fidelity and forgery losses up to (\$*) and above (\$*).

G. Loss of use and revenue from idle properties and idle business resulting from fire, explosion, earthquake, etc. (use and occupancy coverage) and damage to transmission lines, distribution lines, customer services, meters, etc.

H. All liability for bodily injury and/or property damage losses which may exceed the total amount of outside insurance in force on such losses.

Outside insurance risks could be as follows:

A. Fire, inherent explosion and/or extended coverage on all buildings, their contents, gas holders, and other outside facilities on land owned in fee, leased, or for which the company may be liable, now existing or hereafter erected, installed or acquired. As previously stated, certain portions of these facilities may be excluded. Other exceptions to this coverage would be transmission and distribution pipelines outside the premises, as well as customers' services, meters, etc. in or on public highways or property of others.

B. Third party public liability property damage with a limit of (\$*) excess of (\$*), any one occurrence, arising out of fire, smoke, smudge and/or explosion and/or blowout, however caused, earth-

quake, lightning, water damage, windstorm, cyclone and/or tornado.

C. Third party public liability bodily injury including liability under the Workmen's Compensation Act, arising out of any and all operations of the utilities for (\$*) excess of (\$*), any one occurrence. This to include bodily injury liability for the use of automotive equipment.

D. Loss or damage to all property of every kind and description of the utilities, including the cost of debris removal caused by aircraft and/or articles dropped therefrom for (\$*) excess of (\$*), any one occurrence.

E. Fidelity and forgery losses for (\$*) excess of (\$*).

F. Loss or damage to utilities' property and third party public liability as a result of explosion or blowout of steam boilers and pressure vessels for (\$*) excess of (\$*). This coverage automatically provides for the statutory requirements of inspections and certificates of operation.

G. Loss by reason of liability for bodily injury, including death as a result of accident occurring in the use of elevators for (\$*) any one person and (\$*) any one accident. This coverage also provides for the statutory requirements of inspections and certificates of operation.

H. Surety bonds in amounts as required by state, counties, municipalities, or other authorities in connection with consent to self-insure, franchises, excavation permits, use of highways, rights-of-way, etc.

I. Special insuring contracts for employees' social and welfare benefits such as pension plans, non-occupational disability benefits, life insurance, and hospital, surgical and medical benefits. In addition, consideration should be given to insuring employees for death and dismemberment benefits together with medical expense while riding as a passenger in, or boarding, or alighting from a licensed passenger aircraft, etc., when travelling in the course of the business of the utilities.

Of primary importance in the placement of the various outside insured risks are the actual wording and terms of the insuring contract or policy. Also important are investigation of the financial position of the insurance companies, the amount of coverage in each risk to be allocated to the individual insurance company, and last but not least, the rate of premium costs.



1951

APRIL

- 2-4 • A. G. A. Sales Conference on Industrial and Commercial Gas, Industrial and Commercial Gas Section, Shoreham Hotel, Washington, D. C.
- 6 • Maryland Utilities Association, annual meeting, Baltimore, Md.
- 9-11 • A. G. A. Mid-West Regional Gas Sales Conference, Residential Gas Section, Edgewater Beach Hotel, Chicago, Ill.
- 10-12 • Southwestern Gas Measurement Short Course, University of Oklahoma, Norman, Okla.
- 16-18 • A. G. A. Distribution, Motor Vehicles and Corrosion Conference, Hotel Peabody, Memphis, Tenn.
- 16-18 • GAMA annual meeting, Drake Hotel, Chicago, Ill.
- 19-21 • Florida-Georgia Gas Association, Hollywood Beach Hotel, Hollywood Beach, Fla.
- 23-25 • National Conference of Electric and Gas Utility Accountants, Hotel Sherman, Chicago, Ill.
- 23-25 • Southern Gas Association, Biloxi.
- 26-27 • Pacific Coast Research & Utilization Conference, Berkeley, Calif.
- 26-27 • Indiana Gas Association, French Lick Springs Hotel, French Lick

MAY

- 2 • New Jersey Gas Association, home service conference, Military Park Hotel, Newark, N. J.
- 7-8 • A. G. A. Natural Gas Department, spring meeting, Baker Hotel, Dallas.
- 7-11 • National Restaurant Exposition, Navy Pier, Chicago, Ill. (A. G. A. will exhibit)
- 14-16 • A. G. A. Production and Chemical Conference, Hotel New Yorker, New York, N. Y.
- 14-18 • A. G. A. Industrial & Commercial Gas Section, Industrial Gas School, William Penn Hotel, Pittsburgh, Pa.
- 15-17 • Pennsylvania Association, Wernersville, Pa.
- 17-19 • Public Utilities Advertising Association, annual meeting, Hotel New Yorker, N. Y.
- 21-23 • Missouri Association of Public Utilities, Jefferson Hotel, St. Louis, Mo.
- 31-June 1 • Natural Gas and Petroleum Association of Canada, annual convention, Royal Connaught Hotel, Hamilton, Ontario

JUNE

- 18-21 • Canadian Gas Association, annual convention, Bigwin Inn, Lake of Bays, Ontario

OCTOBER

- 15-17 • A. G. A. annual convention, St. Louis, Mo.

A most important item in connection with an over-all insurance program is selection by the utilities of an insurance brokerage firm whose personnel has the experience, knowledge and ability to render the best advice and service. The firm should obtain intimate knowledge of the utilities' business, properties and insurance problems. The insurance broker duly appointed should be responsible for properly advising the utilities in their handling of all matters related to the utilities' outside insurance program. They should also assist in obtaining information when requested on self-insurance problems.

The able broker can be not only the buyer's administrative brawn but also the insurance buyer's expert brains. Here are some of the qualifications as I see them:

A. Are his activities confined to just executing the buyer's orders or does he have managerial talent as well as clerical aptitude represented on his staff? There is no substitute for experience, uncommon sense and something in the head besides teeth.

B. If permitted, the broker should see that the buyer has an over-all program. This, of course, calls for a community of ideas as well as terms. It probably will require an exchange of memoranda to make certain that the buyer and the broker fully understand each other—i.e., do not depend on oral exchanges.

C. Do the rates proposed recognize the type of risk? Has the quality of the insured's housekeeping and the management been recognized?

Annual reports

(Continued from page 22)

Investment Dealers' Digest, *Forbes*, *The Magazine of Wall Street*, *Commercial & Financial Chronicle*, and *Barron's*, including apropos labor publications. *Utility Spotlight*, the industry's weekly executive information service, also should be included, since it reaches an important "top level" influence group with exclusive coverage of many phases of utility operation, financing and public relations.

(12) *Radio and television stations located in the territory you serve*—There are a great many small radio stations located throughout the country serving communities of a restricted size. Receipt of the latest annual report of a gas company that serves substantially the same community as a radio station may elicit comment from announcers. One public utility company, Consolidated Edison Co.

of New York, Inc., regularly uses TV to get its messages across to the public.

Your "special mailing list" should be kept up-to-date or it will lose much of its effectiveness within a few years.

Included in the subject of merchandising your annual report is advertising its availability. The use of advertising as a medium of obtaining better annual report coverage is becoming more generally accepted each year. Depending upon geographical location and public acceptance of the corporation involved, public utility companies have advertised the highlights of their annual reports in newspapers and magazines.

Several tangible values can be gained from advertising your annual report in publications of the type under consideration. In the first place, you have the dual opportunity of reaching both classes of your public—both sophisticated and unsophisticated. The fact that the report is advertised will increase the interest of your stockholders and the people on your "special mailing list." Copies of the advertisements will be clipped for the files of a number of interested institutions, such as banks and insurance companies, that make a practice of maintaining a complete file on your company.

During the last two or three years, some corporations have enlarged their annual report advertising to include labor publications. This seems to be a step in the right direction. It makes known to the reader that the report is available, and lends financial aid to a publication that will appreciate such support.

By advertising your annual report in the proper quarters you gain publicity values that more than cover the budget expenditure involved.

The mechanics of maintaining a "special mailing list" for annual reports warrant serious consideration. When this list is as complete as you can make it, send it on for additional suggestions from your company's treasurer, sales manager, public relations director, advertising director, local managers, your board of directors, and stockholder relations consultant. Don't overlook the chief executive officer of your company.

More and more time, effort and money are being poured into the production of annual reports—the most important medium of communication with your stockholders. One of the surest ways to get a maximum return on each dollar spent is to make this report available to every conceivable public that is interested in your company's operations.

Personnel service

SERVICES OFFERED

Executive Assistant. Many years experience in utility companies. Unusual knowledge general and customers accounting, stores, payroll, plant records, customer records, gas measurement, etc. Can design systems, coordinate paper work. Know all kinds office machines. 1567

Sales-Technical or Industrial Management. Chemical engineer with over 170 years of experience in main manufacturing plant of large New York gas utility. Degree almost completed in industrial engineering. Desires stable position in sales technical service or one allowing for application of industrial engineering practices. New York City or vicinity. Married. Age 26. Favorable references. 1668.

Twenty years' sales background. Thorough knowledge of residential, commercial, and industrial markets. Sales promotion, trade and dealer relations. Interested in utility converting to natural gas service or progressive LP utility. (45). 1669.

Manager or Operational Engineer—22 years' experience in plant operation with working knowledge of most phases of gas industry, particularly training and personnel relations. M. E. Degree. Married. Will locate anywhere. (45). 1670.

Production Engineer. B.S. in Chemical Engineering. Experienced in: Plant management; construction of LP-air and oil-gas installations; and operation of LP-air and water gas plants. Presently employed. 1671.

POSITIONS OPEN

Large gas utility on Eastern seaboard requires the services of an experienced **Industrial Sales Manager.** Applicants must be leaders in gas sales to industrial and commercial customers, and allied fields, with an engineering educational background. Salary commensurate with ability. Reply in confidence giving age, educa-

tion, work experience and other pertinent information. 0601

Graduate Home Economist experienced in natural gas utility field to take responsible charge of new department in Albuquerque, New Mexico, one of the fastest growing cities in the Southwest. Must have pleasing personality, neat appearance, age 25 to 35. Guaranteed monthly salary, pleasant working conditions, numerous attractive employee benefits after period of regular employment. Submit abstract of experience, qualifications, employment history. 0602.

Personnel Director for newly developed Eastern natural gas transmission company. Must have several years experience in oil or gas industry and be willing to travel. In reply, state in detail past experience, education, age, references, salary requirements. Replies held confidential. 0603.

Large and expanding utility company located on the Eastern seaboard needs experienced **Gas Engineer** to assist in contemplated conversion to higher Btu gas. Permanent position is offered to man with at least five years of experience in transmission, distribution and conversion problems. Write giving full particulars of personal background, education, experience and salary desired. Replies will be treated with the strictest confidence. 0604.

Wanted Immediately Engineer experienced in natural gas utility field by one of fastest growing natural gas companies in Southwest. Must have following qualifications. More than 30 years of age. Prefer person with college degree in engineering: petroleum, civil or mechanical. At least three years of college and five years of experience with natural gas or natural gasoline company, including the following phases—drafting, compressor station design and operation, hydrogen sulphide removal plants, gas well testing, gas measurement, drilling operations. Salary commensurate with experience. Pleasant working conditions, numerous attractive employee benefits after period of regular

employment. Location in Dallas, Texas. Submit abstract of experience, qualifications, employment history. 0605.

Gas Engineer—Technical graduate with supervisory experience for large West Virginia blue gas plant making process gas for chemical synthesis. Must have thorough basic knowledge of all gas making processes and ability to translate this into efficient operation. Experience with automatic grates and by-product oven desirable. Salary commensurate with experience. 0606.

Staff Engineer for design and development of gas heating equipment by established midwest corporation located in city of 50,000. Must be college graduate with experience. Excellent salary to right man. Good opportunity to advance. Top employee benefits. All inquiries confidential. 0607.

Engineer to assume full direction of department handling design, laboratory testing, and A. G. A. approval, and initial production liaison on new lines of gas ranges. Work in California for nationally established company. 0608.

Engineer—Age 22 to 35—Preferably mechanical or electrical. Should have degree or the equivalent. Experienced with recording and controlling instruments or gas measurement. \$4000 per year to start with opportunities for advancement. This position is with a large organization located in the Washington, D. C. area. A permanent position with excellent working conditions. Reply stating age, education, work history. 0609.

Assistant Sales Manager—Large eastern gas company requires services of conscientious, ambitious man experienced in the sale of gas and gas appliances as they pertain to the industrial and technical branches of a large gas utility. Acceptable candidates must be capable of directing the aforementioned sections of the Sales Department. Engineering background necessary. Salary commensurate with ability. Reply giving complete resume of educational training and work experience. 0610.

Appliance standards

(Continued from page 29)

test chamber specified for a continued operation test of 720 hours.

Under the former test method the entire pilot was subjected to an ambient temperature condition in the test oven. The new method subjects the pilot hot junction to the desired high temperature, taken as actual metal temperature instead of as an ambient temperature condition, while the cold junction is subjected to a lower metal temperature. The manufacturer may specify the temperatures he desires to meet. These are then checked in appliance tests when the pilot is used in any specific appliance.

Revisions to water heater requirements included standards for a new high temperature classification for automatic storage type heaters. These cover units intended to deliver outlet water at a temperature in excess of 160 degrees. Modern demands for commercial units for sterilizing dishes and tableware, as well as domestic hot water needs for automatic dishwashing and clotheswashing, in many instances call for water up to

180 degrees. Such units first must meet all requirements for ordinary automatic storage type heaters and then additional tests established for such special classification. Testing of such units is optional and will be conducted only on request.

Thermostatic control of gas range ovens was made a mandatory requirement. The committee adopted the range group's recommendation that this provision be made effective immediately. The move has been desired for some time by a vast majority of utility companies as a necessary upgrading of the quality of gas ranges. It also had the full support of the Domestic Gas Range Division of Gas Appliance Manufacturers Association and the gas range section.

H. Carl Wolf, managing director of American Gas Association, stated his appreciation of the work of the committee and its subcommittees in elevating gas appliance standards and advancing the services of gas through the medium of the Laboratories Approval Plan. He expressed the opinion that upgrading of gas appliances is in the best interests of the consumer.

Peak shaving

(Continued from page 9)

of plant and storage, the over-all cost of a propane-air peak shaving plant is materially affected by any change in the cost of steel.

Page 9 contains a tabulation of current construction costs for high pressure (75 psig) propane-air plants.

For some companies, propane-air alone may be the solution to the peak load problem. For still other companies, the propane-air plant may be used in combination with one of the several types of manufactured gas systems devised to produce winter base load gas. When used in such a combination, its advantages are its extreme flexibility of turndown, its faculty of starting up quickly, and requiring only a small operating crew, plus, of course, its interchangeability with natural gas.

Wherever the propane-air plant is used, it can be the answer to the fervent prayers of both the gas plant superintendent and the company treasurer.

A.G.A. Advisory Council

F. M. BANKS.....Los Angeles, Calif.
R. G. BARNETT.....Portland, Ore.
WALTER C. BECKJORD....Cincinnati, Ohio
JAMES A. BROWN.....Jackson, Mich.
ERNEST G. CAMPBELL.....Chicago, Ill.
W. M. CHAMBERLAIN.....Grand Rapids, Mich.
ARTHUR C. CHERRY.....Cincinnati, Ohio
B. T. FRANCK.....Milwaukee, Wis.
W. R. FRASER.....Detroit, Mich.
C. S. GOLDSMITH.....Brooklyn, N. Y.
OLIVER S. HAGERMAN.....Charleston, W. Va.
H. E. HANDLEY.....Jackson, Mich.
R. H. HARGROVE.....Shreveport, La.
D. P. HARTSON.....Pittsburgh, Pa.
R. W. HENDEE....Colorado Springs, Colo.
W. M. JACOBS.....Los Angeles, Calif.
W. F. McCONNOR.....Pittsburgh, Pa.
H. PRESTON MOREHOUSE..Newark, N. J.
E. P. NOPPEL.....New York, N. Y.
R. L. O'BRIEN.....Detroit, Mich.
D. P. O'KEEFE.....Los Angeles, Calif.
LEON OURUSOFF.....Washington, D. C.
C. E. PAIGE.....Brooklyn, N. Y.
HUDSON W. REED.....Philadelphia, Pa.
L. E. REYNOLDS.....Hartford, Conn.
ARTHUR B. RITZENTHALER..Mansfield, Ohio
JOHN A. ROBERTSHAW...Greensburg, Pa.
JOHN H. W. ROPER....Washington, D. C.
W. H. RUDOLPH.....Newark, N. J.
LOUIS B. SCHIESZ.....Indianapolis, Ind.
CARL A. SCHLEGEL.....Philadelphia, Pa.
ALVAN H. STACK.....Tampa, Fla.
D. B. STOKES.....Burlington, N. J.
E. J. TUCKER.....Toronto, Ontario
L. V. WATKINS.....New York, N. Y.
JOHN A. WILLIAMS.....Syracuse, N. Y.

PAR COMMITTEE

Chairman—Norman B. Bertolette, The Hartford Gas Co., Hartford, Conn.

FINANCE COMMITTEE

Chairman—Frank H. Lerch, Jr., Consolidated Natural Gas Co., New York

Associated organizations

GAS APPLIANCE MANUFACTURERS ASSOCIATION

Pres.—Frederic O. Hess, Selas Corp. of America, Philadelphia, Pa.
Man. Dir.—H. Leigh Whitelaw, 60 East 42nd St., New York, N. Y.

CANADIAN GAS ASSOCIATION

Pres.—Hugh G. Smith, The Consumers' Gas Co. of Toronto, Toronto, Ontario.
Exec. Sec.-Tr.—Warner A. Higgins, P.O. Box 158, Terminal "A," Toronto.

FLORIDA-GEORGIA GAS ASSOCIATION

Pres.—John L. Arnold, Albany, Ga., Gas Department.
Sec.-Tr.—J. W. Owen, Central Florida Gas Corp., Winter Haven, Fla.

ILLINOIS PUBLIC UTILITIES ASSOCIATION

Pres.—C. W. Organ, Central Illinois Light Co., Springfield, Ill.
Sec.-Tr.—T. A. Schlink, Central Illinois Light Co., Springfield, Ill.

INDIANA GAS ASSOCIATION

Pres.—C. K. Graham, Southern Indiana Gas & Electric Co., Evansville, Ind.
Sec.-Tr.—Clarence W. Goris, Northern Indiana Public Service Co., Gary, Ind.

MARYLAND UTILITIES ASSOCIATION

Pres.—Glenn T. Swisher, The Potomac Edison Co., Frederick, Md.
Sec.—Raymond C. Brehaut, Box 338, Frederick, Md.

MICHIGAN GAS ASSOCIATION

Pres.—Henry Tuttle, Michigan Consolidated Gas Co., Detroit, Mich.
Sec.-Tr.—A. G. Schroeder, Michigan Consolidated Gas Co., Grand Rapids, Mich.

MID-SOUTHEASTERN GAS ASSOCIATION

Pres.—J. D. Barnes, Piedmont Gas Co., Hickory, N. C.
Sec.-Tr.—Edward W. Ruggles, North Carolina State College, Raleigh, N. C.

MID-WEST GAS ASSOCIATION

Pres.—Larry Shomaker, Northern Natural Gas Co., Omaha, Neb.
Sec.-Tr.—Harold E. Peckham, Northern States Power Co., St. Paul, Minn.

MISSOURI ASSOCIATION OF PUBLIC UTILITIES

Pres.—Robert W. Otto, Laclede Gas Co., St. Louis, Mo.
Gen. Counsel—Wm. H. Allen, 101 W. High Street, Jefferson City, Mo.

NATURAL GAS AND PETROLEUM ASSOCIATION OF CANADA

Pres.—George H. Smith, Port Colborne—Welland Gas & Oil Co., Port Colborne, Ontario.
Sec.—Joseph McKee, United Gas and Fuel Co. of Hamilton, Ltd., Hamilton, Ont.

NEW ENGLAND GAS ASSOCIATION

Pres.—John A. Hiller, Portland Gas Light Co., Portland, Me.
Man. Dir.—Clark Belden, 41 Mt. Vernon St., Boston, Mass.

NEW JERSEY GAS ASSOCIATION

Pres.—Robert H. Philipps, Jr., Public Service Electric & Gas Co., Newark, N. J.
Sec.-Tr.—Elmer A. Smith, Public Service Electric and Gas Co., Newark, N. J.

OKLAHOMA UTILITIES ASSOCIATION

Pres.—C. N. Robinson, Public Service Co. of Oklahoma, Tulsa, Okla.
Sec.—Kate A. Niblack, 625 Biltmore Hotel, Oklahoma City, Okla.

PACIFIC COAST GAS ASSOCIATION

Pres.—E. G. Lawson, Pacific Public Service Co., San Francisco, Calif.
Man. Dir.—Clifford Johnstone, 447 Sutter St., San Francisco, Calif.

PENNSYLVANIA GAS ASSOCIATION

Pres.—Thomas S. Lever, Jr., The Philadelphia Gas Works Co., Philadelphia, Pa.
Sec.—William Naille, Lebanon Valley Gas Co., Lebanon, Pa.

PENNSYLVANIA NATURAL GAS MEN'S ASSOCIATION

Pres.—J. J. Jacob, Jr., The Peoples Natural Gas Co., Pittsburgh, Pa.
Exec. Sec.—Mark Shields, 2619 Grant Bldg., Pittsburgh, Pa.

SOUTHERN GAS ASSOCIATION

Pres.—C. H. Horne, Alabama Gas Corp., Birmingham, Ala.
Man. Dir.—Robert R. Suttle, 1922 M & W Tower, Dallas 1, Texas.

WISCONSIN UTILITIES ASSOCIATION

Pres.—Alfred Gruhl, Wisconsin Electric Power Co., Milwaukee, Wis.
Exec.-Sec.—A. F. Herwig, 135 West Wells St., Milwaukee, Wis.

American Gas Association

HEADQUARTERS, 420 LEXINGTON AVE., NEW YORK 17, N. Y.

A. G. A. LABORATORIES • 1032 East 62nd Street, Cleveland 3, Ohio • 1425 Grande Vista Avenue, Los Angeles, Calif.

◀ Officers ▶

President	D. A. HULCY	Dallas, Texas
First Vice-President	GEORGE F. MITCHELL	Chicago, Ill.
Second Vice-President	C. E. BENNETT	Pittsburgh, Pa.
Treasurer	EDWARD F. BARRETT	Mineola, N. Y.
Assistant Treasurer	V. T. MILES	Mineola, N. Y.
Managing Director	H. CARL WOLF	New York, N. Y.
Secretary	KURWIN R. BOYES	New York, N. Y.

◀ Department Chairmen ▶

Manufactured Gas Department	GEORGE F. MITCHELL	Chicago, Ill.
Natural Gas Department	C. E. BENNETT	Pittsburgh, Pa.

◀ Section Vice-Presidents and Chairmen ▶

Accounting Section	ALAN A. CULLMAN	New York, N. Y.
Industrial and Commercial Gas Section	CARL H. LEKBERG	Hammond, Ind.
Manufacturers' Section	W. REED MORRIS	New York, N. Y.
Publicity and Advertising Committee	CHARLES J. ALLEN	Waterbury, Conn.
Operating Section	R. VAN VLIET	Staten Island, N. Y.
Residential Gas Section	CARL H. HORNE	Birmingham, Ala.
A. G. A. Laboratories	ARTHUR F. BRIDGE	Los Angeles, Calif.

◀ Directors ▶

B. C. ADAMS	Kansas City, Mo.	ROBERT A. HORNBY	San Francisco, Calif.
A. M. BEEBEE	Rochester, N. Y.	LOUIS RUTHENBURG	Evansville, Ind.
N. B. BERTOLETTE	Hartford, Conn.	F. A. LYDECKER	Newark, N. J.
L. B. BONNETT	New York, N. Y.	J. F. MERRIAM	Omaha, Neb.
EVERETT J. BOOTHBY	Washington, D. C.	DEAN H. MITCHELL	Hammond, Ind.
EDWARD G. BOYER	Philadelphia, Pa.	JAMES S. MOULTON	San Francisco, Calif.
A. W. CONOVER	Pittsburgh, Pa.	ROBERT W. OTTO	St. Louis, Mo.
HUGH H. CUTHRELL	Brooklyn, N. Y.	J. FRENCH ROBINSON	Cleveland, Ohio
E. H. EACKER	Boston, Mass.	FRANK C. SMITH	Houston, Texas
HENRY FINK	Detroit, Mich.	R. G. TABER	Atlanta, Ga.
J. N. GREENE	Birmingham, Ala.	ALLYN C. TAYLOR	Reading, Pa.
JOHN L. HALEY	Syracuse, N. Y.	PAUL R. TAYLOR	New York, N. Y.
LYLE C. HARVEY	Cleveland, Ohio	THOMAS WEIR	Chatham, Ontario
FREDERIC O. HESS	Philadelphia, Pa.	HARRY K. WRENCH	Minneapolis, Minn.
STANLEY H. HOBSON	Rockford, Ill.	CHARLES G. YOUNG	Springfield, Mass.
C. H. ZACHRY	Dallas, Texas		

◀ Association Staff ▶

Managing Director	H. CARL WOLF	Secretary, Residential Gas Section	F. W. WILLIAMS
Assistant Managing Director, Secretary, PAR Committee, Acting Secretary, Manufactured Gas Department	JOHN W. WEST, JR.	Home Service Counsellor	JESSIE McQUEEN
Assistant Managing Director and Director, Natural Gas Dept.	GEORGE H. SMITH	Coordinator, Promotion	H. VINTON POTTER
Director, A. G. A. Laboratories, and Assistant Managing Director, A. G. A.	EDWIN L. HALL	Secretary, New Freedom Gas Kitchen Program	NORVAL D. JENNINGS
Secretary and Convention Manager	KURWIN R. BOYES	Director, Advertising	CHARLES W. PERSON
Controller & Assistant Secretary	O. W. BREWER	Director, Publicity	GEORGE A. McDONALD
Director, Bureau of Statistics	OTTO E. ZWANZIG	Manager, Pacific Coast Branch Laboratories (Los Angeles, Calif.)	W. H. VOGAN
Secretary, Accounting Section	THOMAS J. SHANLEY	Coordinator, Utilization Research	EUGENE D. MILENBERG
Secretary, Industrial and Commercial Gas Section	MAHLON A. COMBS	Consultant, Research	DR. N. K. CHANEY
Acting Secretary, Operating Section	J. STANFORD SETCHELL	Coordinator, Gas Production Research	THOMAS LEE RONEY
		Utilization Engineer	C. GEORGE SEGELER
		Manager, Publications	JAMES M. BEALL
		Editor, A. G. A. Monthly	JAC A. CUSHMAN

, Calif.

Texas

go, Ill.

gh, Pa.

, N. Y.

, N. Y.

, N. Y.

, N. Y.

go, Ill.

gh, Pa.

t, N. Y.

d, Ind.

t, N. Y.

, Conn.

d, N. Y.

m, Ala.

s, Calif.

o, Calif.

le, Ind.

k, N. J.

o, Neb.

nd, Ind.

o, Calif.

uis, Mo.

d, Ohio

n, Texas

nta, Ga.

ing, Pa.

k, N. Y.

Ontario

s, Minn.

d, Mass.

WILLIAMS

McQUEEN

POTTER

WENNINGS

PERSON

DONALD

VOGAN

MILENIR

CHANET

ROBERT

SEGELER

A. BEALL

USHMAN